# GAS

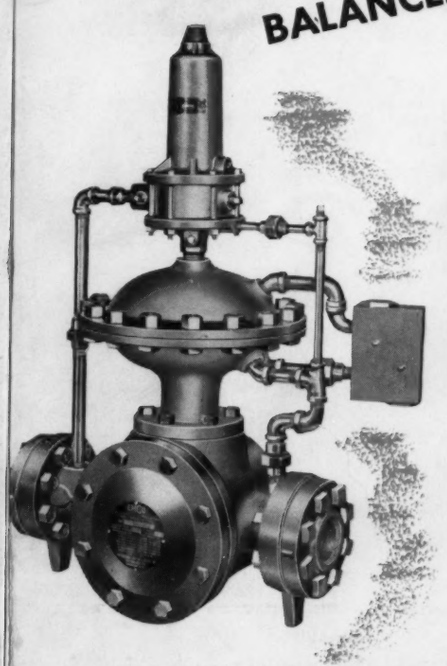
ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT

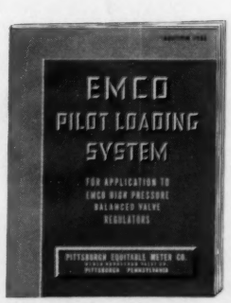


New Emco

PILOT LOADING SYSTEM—TYPE 39

FOR APPLICATION TO EMCO HIGH PRESSURE BALANCED VALVE REGULATORS . . .



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- GREATER FLEXIBILITY
- HIGHER ACCURACY
- INCREASED SENSITIVITY

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INSTRUMENT ACCURACY COMBINED WITH FIELD RUGGEDNESS! The elimination of the bleed gas to atmosphere combined with an instrument sensitive, yet sturdy control, yields the ultimate in serviceability and accuracy. The design is so arranged that this highly desirable improvement can be applied to any existing EMCO High Pressure Balanced Valve Regulator.

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MERCO NORDSTROM VALVE CO.
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*Main Offices* - PITTSBURGH, PA.
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JANUARY 1940 ◆ ◆ 25 CENTS

YOU *can* keep a good pipe down! Witness several cities with cast iron distribution mains in service that were laid a century ago, equalling in life the gas industry itself. Today's cast iron pipe is an even better product. Today's *mechanical joint* cast iron pipe makes a permanent, swiftly-assembled, *bottle-tight* line under modern operating conditions. All mechanical joints, made by CIPRA members, are based on the stuffing-box principle.

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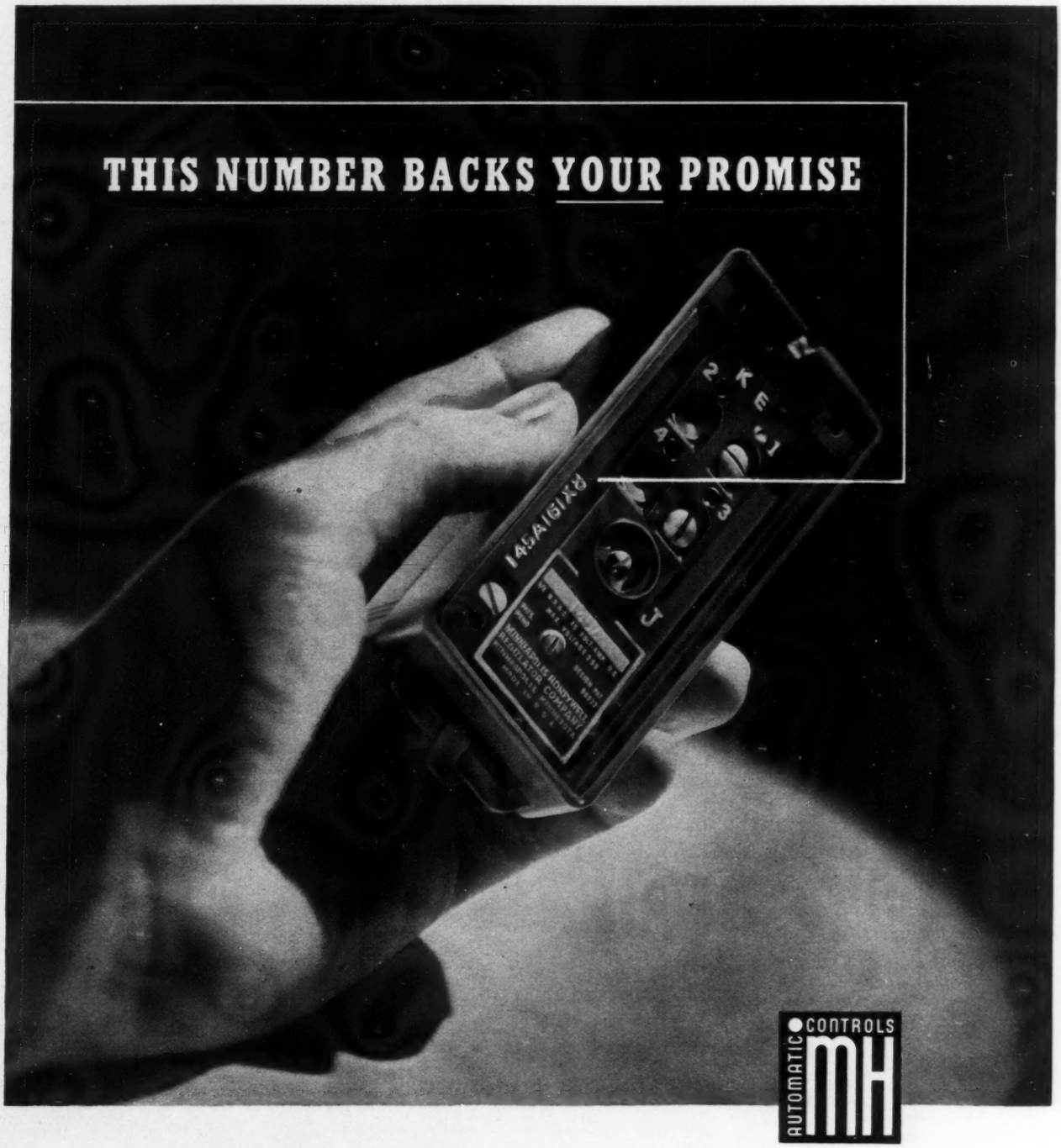


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H. R. Basford Co. 62
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Blaw-Knox Co. ..
Bundy Tubing Co. ..
Butane-Propane News 54

Carbide and Carbon Chemicals Corp. ..
Cast Iron Pipe Research Association
Second Cover
The Chaplin-Fulton Manufacturing Co. 50
Chicago Vitreous Enamel Products Co. ..
The Cleveland Trencher Co. 51
Condensation Engineering Corp. 52
Connelly Iron Sponge & Governor Co. ..
The Cooper-Bessemer Corp. ..
Crane Co. ..
Cribben & Sexton Co. 9, 10, 11

Detroit-Michigan Stove Co. 45
Dresser Manufacturing Co. ..

Fisher Governor Co. ..
Fraser Furnace Co. 62

Gasair Corp. 48
General Controls 53
General Gas Light Co. 63
James Graham Manufacturing Co. 49
Greenlee Tool Co. 63

Handbook Butane-Propane Gases, Revised Second Edition 60
Howle Co. ..

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Johnson Gas Appliance Co. ..

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P. M. Lattner Manufacturing Co. 59
Little Giant Water Heater Co. 48

Merco Nordstrom Valve Co. ..
Milwaukee Gas Specialty Co. 58
Minneapolis-Honeywell Regulator Co. 1
Mueller Co. Third Cover
L. J. Mueller Furnace Co. 56

The National Supply Co. 5
National Tube Co. 6, 7

Pacific Gas & Electric Co. 55
Pacific Gas Radiator Co. 57
Pacific Meter Works 14
Payne Furnace & Supply Co. 58
Philgas Dept., Phillips Petroleum Co. ..
Pittsburg Water Heater Corp. ..
Pittsburgh Equitable Meter Co. Front Cover

Reliance Regulator Corp. ..
Republic Heaters Sales Co. 51
Republic Steel Corp. ..
Reynolds Gas Regulator Co. 61
Robertshaw Thermostat Co. ..
George D. Roper Corp. ..

Semet-Solvay Engineering Corp. 56
Servel, Inc., Electrolux Sales Division 42, 43
Sharples Solvents Corp. 3
M. B. Skinner Co. ..
Spencer Thermostat Co. 57
The Sprague Meter Co. Fourth Cover
Standard Oil Company of California ..

U. S. Pipe & Foundry Co. 8
United States Steel 6, 7

The Vent-A-Hood Co. 52

Ward Heater Co., Ltd. ..
Webster Engineering Co. ..
Welsbach Co. 50
Worthington Pump & Machinery Corp. 12

John Zink Burner Co. 4



# GAS

*Fifteenth Year of Publication*


# Contents for January, 1940


GUEST EDITORIAL: One of the Industry's Best Assets *By R. M. Conner* 13

Thermally Thinking . . . . . 15

A Light That Has Not Failed . . . . . *By J. H. Reed* 17

Methods of Estimating the Corrosivity of Soils *By K. H. Logan and E. A. Koenig* 19

A Review of Southern Union Gas Company's Sales Boosting Employe Merchandising Campaigns . . . . . *By Craig Espy* 23

G A S Camera . . . . . 25

Selling Gas in Summer . . . . . *By Allen W. Lundstrum* 26

Appliance Service Charge Increases Utility Income . *By Hall M. Henry* 29

Irrigating the New Mexico Desert With Natural Gas . *By H. N. Oldham* 30

United Gas Pipe Line Company's Mississippi River Crossing *By D. E. Stearns* 32

Improving Gas Usage With Coffee Urns, Steam Tables *By Lawrence R. Foote* 35

Natural Gas—Now a Major Mid-Continent Development *By Burt R. Bay* 37

Sales Slants . . . . . 40

Current Reading . . . . . 52

Industry Personalities . . . . . 56

Modern Products . . . . . 62



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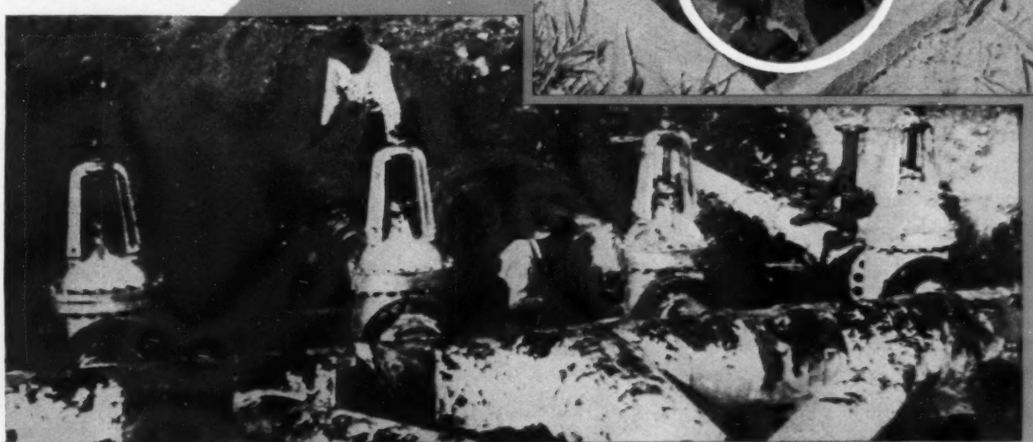
*Pentalarm Your Pipelines!*



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## Heating Burners That Work!

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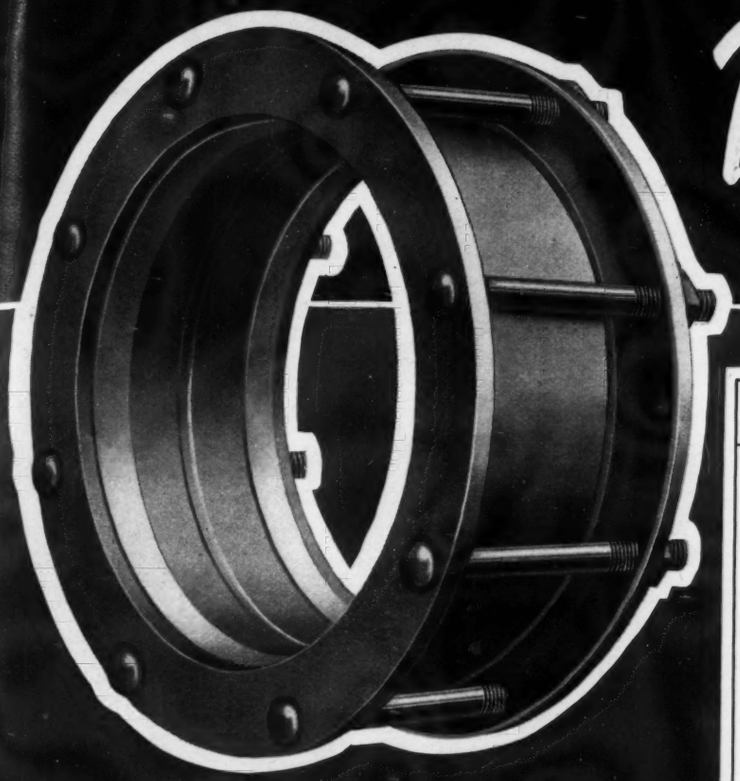
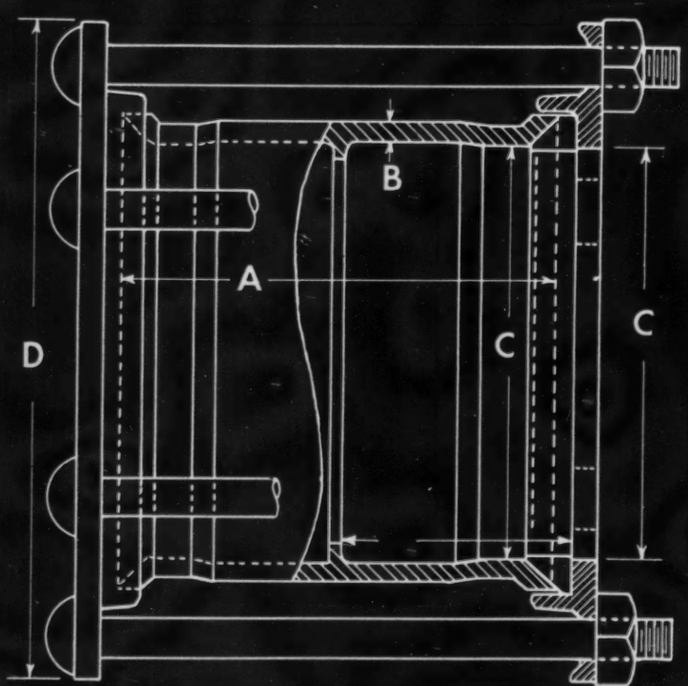


● A coupling for connecting plain end steel pipe that eliminates the necessity of special processing of pipe for installation . . . a coupling so simple in design and construction that a permanent leakproof installation can be quickly effected by the most unskilled laborer.

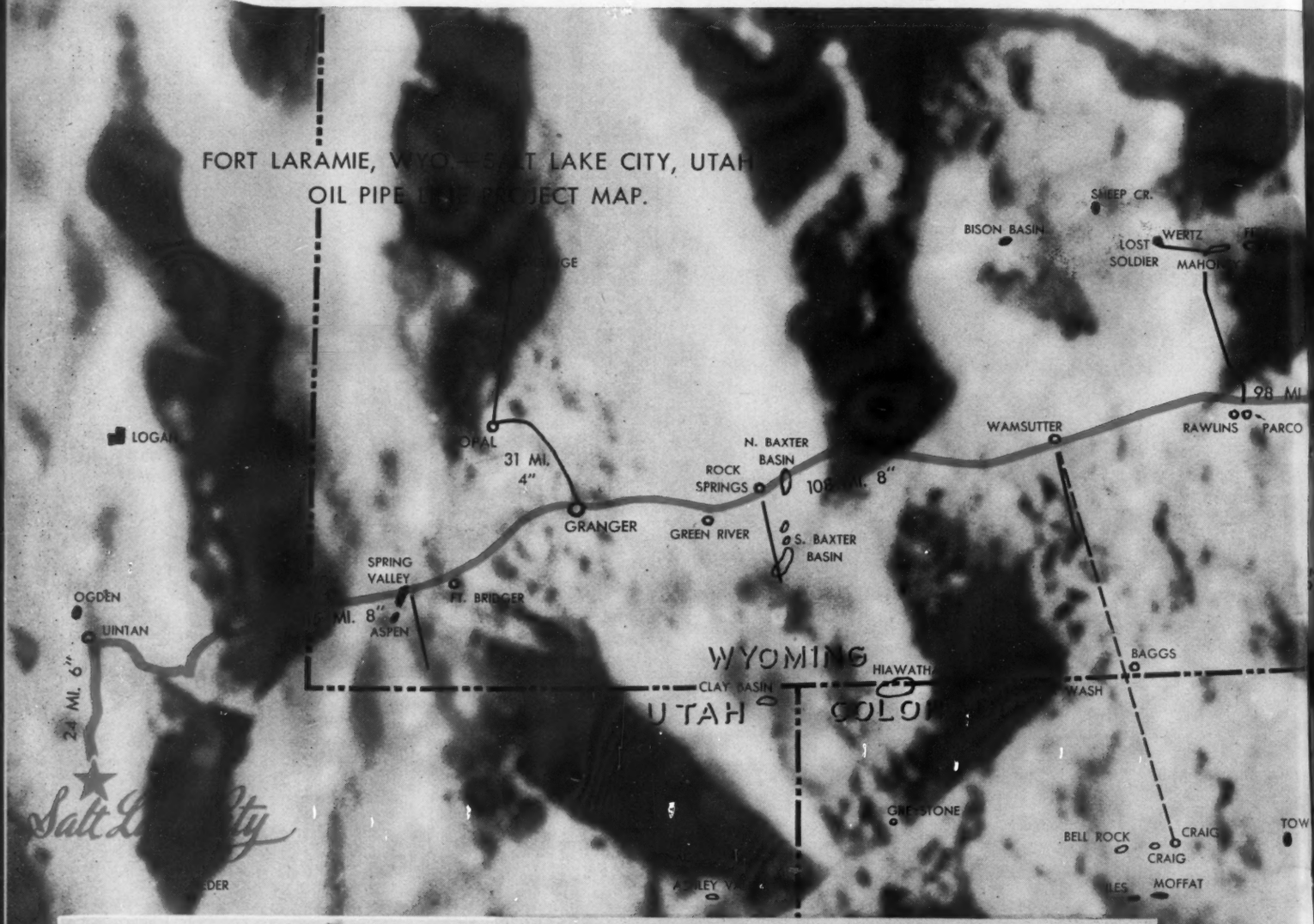



| I.D. | O.D. | WT. | A | B | C | D | BOLTS | | Flange |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | No. | SIZE | |
| .500 | .840 | 2 | 5 | .134 | .910 | 3.375 | 2 | .375 x 6.5 | Malleable Flanges |
| .750 | 1.050 | 2¾ | 5 | .125 | 1.120 | 3.875 | 2 | .500 x 6.75 | |
| 1.000 | 1.315 | 3¼ | 5 | .148 | 1.385 | 4.062 | 2 | .500 x 6.75 | |
| 1.250 | 1.660 | 3¾ | 5 | .156 | 1.730 | 4.50 | 2 | .500 x 6.75 | |
| 1.500 | 1.900 | 4¼ | 5 | .168 | 1.970 | 4.812 | 2 | .500 x 6.75 | |
| 2.000 | 2.375 | 6¾ | 5 | .180 | 2.445 | 5.812 | 2 | .625 x 7 | |
| 2.000 | 2.375 | 8½ | 5 | .180 | 2.445 | 5.812 | 3 | .625 x 7 | |
| 2.500 | 2.875 | 10 | 5 | .232 | 2.945 | 6.312 | 3 | .625 x 7 | |
| 2.750 | 3.000 | 10 | 5 | .232 | 3.07 | 6.375 | 3 | .625 x 7 | |
| 3.000 | 3.500 | 13 | 5 | .230 | 3.57 | 7.187 | 4 | .625 x 7 | |
| 3.000 | 3.500 | 15 | 7 | .230 | 3.57 | 7.187 | 4 | .625 x 9 | |
| 3.500 | 4.000 | 13½ | 5 | .230 | 4.07 | 7.687 | 4 | .625 x 7 | |
| 4.000 | 4.500 | 19 | 5 | .250 | 4.57 | 8.688 | 4 | .625 x 7 | |
| 4.000 | 4.500 | 20½ | 7 | .237 | 4.57 | 8.688 | 4 | .625 x 9 | |
| 4.500 | 5.000 | 15 | 5 | .250 | 5.07 | 8.50 | 4 | .625 x 7.5 | |
| 4.500 | 5.000 | 23 | 7 | .312 | 5.07 | 8.50 | 4 | .625 x 10 | |
| 4.750 | 5.250 | 18 | 5 | .250 | 5.32 | 8.875 | 4 | .625 x 7.5 | |
| 4.750 | 5.250 | 24 | 7 | .312 | 5.32 | 8.875 | 4 | .625 x 10 | |
| 5.000 | 5.500 | 20 | 5 | .250 | 5.562 | 9.125 | 4 | .625 x 7.5 | D |
| 5.000 | 5.500 | 28 | 7 | .312 | 5.562 | 9.125 | 4 | .625 x 10 | D |
| 5.625 | 6.000 | 22 | 5 | .250 | 6.062 | 9.625 | 4 | .625 x 8 | D |
| 5.625 | 6.000 | 25 | 7 | .250 | 6.062 | 9.625 | 4 | .625 x 10 | D |
| 5.625 | 6.000 | 27 | 7 | .312 | 6.062 | 9.625 | 4 | .625 x 10 | D |
| 6.000 | 6.625 | 25 | 5 | .250 | 6.688 | 10.50 | 6 | .625 x 8 | D |
| 6.000 | 6.625 | 29 | 7 | .250 | 6.688 | 10.50 | 6 | .625 x 10 | D |
| 6.000 | 6.625 | 31½ | 7 | .312 | 6.688 | 10.50 | 6 | .625 x 10 | D |
| 6.625 | 7.000 | 26 | 5 | .250 | 7.062 | 10.62 | 6 | .625 x 8 | D |
| 6.625 | 7.000 | 31 | 7 | .250 | 7.062 | 10.62 | 6 | .625 x 10 | D |
| 6.625 | 7.000 | 33 | 7 | .312 | 7.062 | 10.62 | 6 | .625 x 10 | D |
| 7.625 | 8.000 | 28½ | 5 | .250 | 8.062 | 11.69 | 6 | .625 x 8 | D |
| 7.625 | 8.000 | 34 | 7 | .250 | 8.062 | 11.69 | 6 | .625 x 10 | D |
| 7.625 | 8.000 | 37 | 7 | .312 | 8.062 | 11.69 | 6 | .625 x 10 | D |
| 8.000 | 8.625 | 30½ | 5 | .250 | 8.688 | 12.62 | 6 | .625 x 8 | D |
| 8.000 | 8.625 | 33 | 5 | .312 | 8.688 | 12.62 | 6 | .625 x 8 | D |
| 8.000 | 8.625 | 35 | 7 | .250 | 8.688 | 12.62 | 6 | .625 x 10 | D |
| 8.000 | 8.625 | 37 | 7 | .312 | 8.688 | 12.62 | 6 | .625 x 10 | D |
| 9.625 | 10.00 | 43 | 5 | .250 | 10.06 | 14.13 | 8 | .625 x 8.5 | C |
| 9.625 | 10.00 | 47½ | 7 | .250 | 10.06 | 14.13 | 8 | .625 x 10.5 | C |
| 10.00 | 10.75 | 45½ | 5 | .250 | 10.81 | 14.81 | 8 | .625 x 8.5 | C |
| 10.00 | 10.75 | 48¾ | 5 | .312 | 10.81 | 14.81 | 8 | .625 x 8.5 | C |
| 10.00 | 10.75 | 52 | 7 | .250 | 10.81 | 14.81 | 8 | .625 x 10.5 | C |
| 10.00 | 10.75 | 56½ | 7 | .312 | 10.81 | 14.81 | 8 | .625 x 10.5 | C |
| 11.62 | 12.00 | 50 | 5 | .250 | 12.06 | 16.19 | 8 | .625 x 8.5 | C |
| 11.62 | 12.00 | 56 | 7 | .250 | 12.06 | 16.19 | 8 | .625 x 10.5 | C |
| 11.62 | 12.00 | 61 | 7 | .312 | 12.06 | 16.19 | 8 | .625 x 10.5 | C |
| 12.00 | 12.75 | 52½ | 5 | .250 | 12.81 | 16.93 | 8 | .625 x 8.5 | C |
| 12.00 | 12.75 | 56 | 5 | .312 | 12.81 | 16.93 | 8 | .625 x 8.5 | C |
| 12.00 | 12.75 | 60½ | 7 | .250 | 12.81 | 16.93 | 8 | .625 x 10.5 | C |
| 12.00 | 12.75 | 64½ | 7 | .312 | 12.81 | 16.93 | 8 | .625 x 10.5 | C |
| 12.50 | 13.00 | 52½ | 5 | .250 | 13.06 | 17.19 | 8 | .625 x 8.5 | C |
| | 14.00 | 58 | 5 | .250 | 14.09 | 18.19 | 10 | .625 x 8.5 | C |
| | 14.00 | 66 | 7 | .250 | 14.09 | 18.19 | 10 | .625 x 10.5 | C |
| | 14.00 | 72 | 7 | .312 | 14.09 | 18.19 | 10 | .625 x 10.5 | C |
| | 16.00 | 70 | 7 | .250 | 16.09 | 20.25 | 10 | .625 x 10.5 | C |
| | 16.00 | 79 | 7 | .312 | 16.09 | 20.25 | 10 | .625 x 10.5 | C |
| | 16.00 | 85½ | 7 | .375 | 16.09 | 20.25 | 10 | .625 x 10.5 | C |
| | 18.00 | 97½ | 7 | .312 | 18.09 | 22.37 | 10 | .625 x 10.5 | E |
| | 18.00 | 105 | 7 | .375 | 18.09 | 22.37 | 10 | .625 x 10.5 | E |
| | 20.00 | 104 | 7 | .250 | 20.09 | 24.37 | 12 | .625 x 10.5 | E |
| | 20.00 | 110 | 7 | .312 | 20.09 | 24.37 | 12 | .625 x 10.5 | E |
| | 20.00 | 117 | 7 | .375 | 20.09 | 24.37 | 12 | .625 x 10.5 | E |
| | 22.00 | 142 | 7 | .375 | 22.09 | 26.44 | 14 | .625 x 10.5 | F |
| | 24.00 | 152 | 7 | .375 | 24.09 | 28.44 | 14 | .625 x 10.5 | F |


**THE NATIONAL SUPPLY COMPANY**
**DAYTON COUPLING DIVISION**
**TOLEDO, OHIO**

# "WALLS WITH
# Cross the

FORT LARAMIE, WYO. — SALT LAKE CITY, UTAH
OIL PIPE LINE PROJECT MAP.

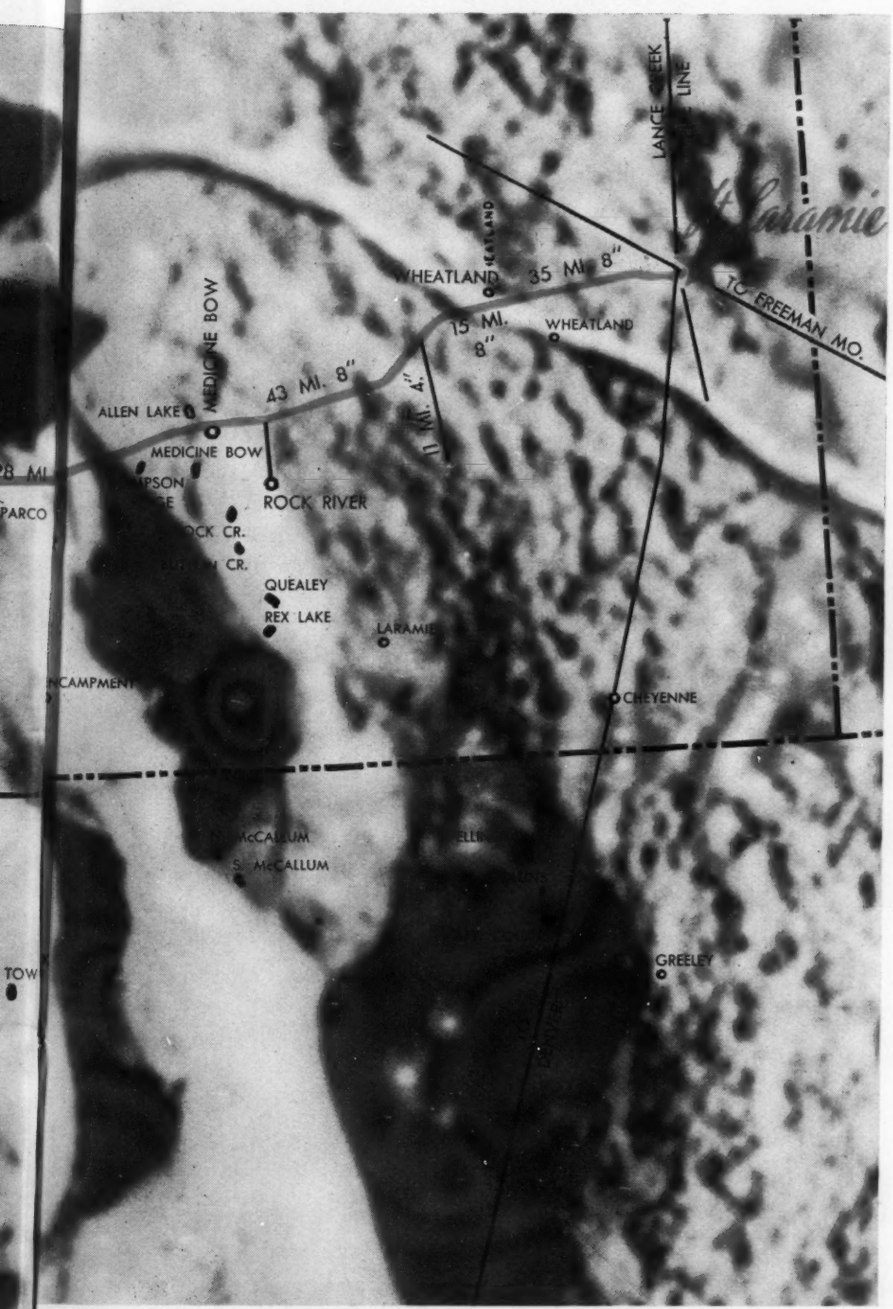


**MAP SHOWS ROUTE** new line of NATIONAL Seamless is taking. Elevations range from 4230 feet at its eastern terminus at Fort Laramie, Wyoming, to 7178 feet at the point just east of Wamsutter where it will cross the Continental Divide. As shown on the relief map above, this line traverses many varied types of terrain — across mountain ranges and over flat plateaus, barren land and fertile plain, over several rivers and innumerable small streams.

*At left*—**SOLID TRAIN LOADS OF NATIONAL SEAMLESS READY TO GO TO WORK.** Here is shown part of the many shipments of "Walls Without Welds" used on this vast project.

# HOUT WELDS"

# e Continental Divide




## Record-Breaking Pipe Line ...Longest Since 1930... 438 Miles of NATIONAL SEAMLESS

*America's Preferred Pipe for Gas and Oil Lines*

UP over the Rockies, across the Continental Divide, goes this record-breaking pipe line to add new laurels to the already long list of achievements of NATIONAL Seamless.

Destined to carry crude oil to the Salt Lake City Refinery of the Utah Refining Company, this line will be approximately 438 miles long, of which 414 miles will be eight-inch pipe and 24 miles six-inch pipe . . . NATIONAL Seamless Line Pipe every foot of the way. This is the longest pipe line laid in the last nine years. Significant, too, is the fact that this is the first major oil line to be constructed in the Rocky Mountains across the Continental Divide. It will provide an outlet for new fields which may be developed along its route as production from existing fields declines. The line is expected to be completed and in operation by the end of the year.

NATIONAL Seamless was specified for this important line because it is an accepted fact that "Walls Without Welds" provide the extra margin of strength to withstand unpredictable stresses, ground settlements and unexpected pressures. NATIONAL Seamless will move oil economically through this mountainous territory for many years. For it is pierced from solid billets of finest quality steel. It provides full wall strength throughout, uniformly straight lengths, carefully finished ends, ample ductility for easy bending, and clean, smooth surfaces. It is readily handled and joined with minimum time and labor. Its use is your assurance of utmost dependability on every job.

## NATIONAL TUBE COMPANY

PITTSBURGH, PA.

United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

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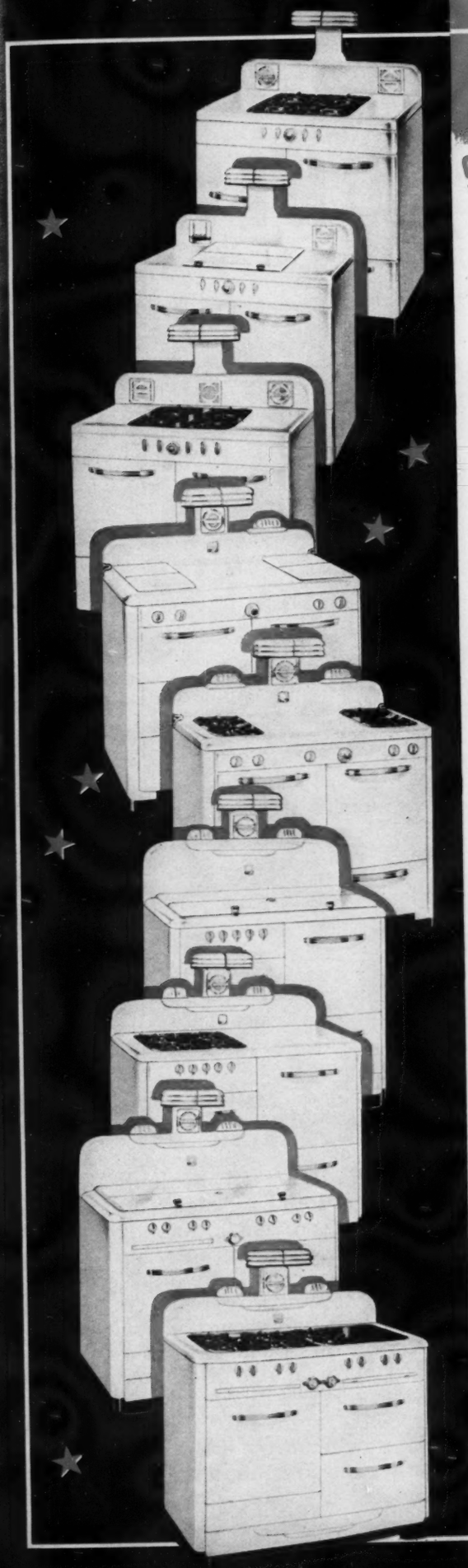
Hail to the Forties! We greet the new decade and report on progress in the decade which has passed. During the Thirties this Company developed and patented the Super-de Lavaud process of casting gray iron centrifugally in a metal mold without chill—erected and equipped a headquarters research laboratory at Burlington—completed a broad modernization program with augmented facilities for centrifugal casting at Bessemer and Birmingham, and an extension and improvement of our plant at Chattanooga, particularly for the manufacture of fittings and special castings. We begin our fifth decade better than ever equipped for service.

# U.S. cast iron PIPE

*for water works, gas, sewerage, drainage and industrial services.*

U. S. PIPE AND FOUNDRY CO. General Offices: Burlington, N. J.



UNIVERSAL GAS RANGES

STRAND · DALTON · OXFORD · MARLBORO · MERCURY · MONITOR · ARGYLE · GOTHAM

# UNIVERSAL *sets the* SALES TEMPO *for* 1940

*Presenting*

**A GREATER MEASURE OF QUALITY**
**A NEW STANDARD OF VALUE**

ANDOVER · MANHATTAN

*See* NEXT PAGE

**UNIVERSAL**

*The Balanced Line for Profit*

# UNIVERSAL

## GAS RANGES for 1940

A New Low

A NEW ALL

*Argyle Universal*

Elevated "Duo-Action" In-A-Drawer Broiler—Four Burner —16-Inch Oven Gas Range

The Argyle Universal represents the lowest priced elevated broiler range which Cribben & Sexton Company has ever offered the trade. The broiling compartment is unusually deep. The Argyle, measuring 38 inches overall, embodies Center Burner Top, Precision Oven, Service Drawer and the new "Klik-Set" Burners.

ARGYLE • UNIVERSAL

*Andover Universal*

Four Burner 16-Inch Oven In-A-Drawer Broiler Gas Range

The Andover is a companion unit to the Argyle with standard In-A-Drawer Broiler, Large Storage Compartment and Service Drawer. The Andover features the new "Klik-Set" Burners which give controlled simmering heat at click of valve. It is an outstanding value per dollar of cost.

ANDOVER • UNIVERSAL

*Universal*

THE BALANCED LINE

*for Profit!*

Universal for 1940 not only presents "A Balanced Line for Profit", but also "A Balanced Line for Greater Sales Efficiency". Universal comprises a complete line, from the kitchenette range to the double oven, six burner Strand Universal. The 1940 Universal line permits complete sales concentration on one basic line in all price brackets. Universal also offers a complete price range in CP models. The Universal line for 1940 is entirely new. It has a wealth of new features. It has eye-appeal. It offers a superior standard of cooking

UNIVERSAL GAS RANGES

MANUFACTURED BY

*Cribben and Sexton Company*

700 N. SACRAMENTO BLVD., CHICAGO

UNIVERSAL ★ THE BEST

# Cost for Superior Performance

# TIME HIGH IN VALUE!

*Manhattan Universal*

Four Burner–16-Inch Oven–In-A-Drawer Broiler–36-Inch Gas Range

The Manhattan is a compact unit, occupying only 36 inches of floor space. It is similar in general design to Argyle-Andover ranges. It is equipped with a Large Storage Compartment, "Klik-Set" Burners, In-A-Drawer Broiler and 16-Inch Precision Oven. The Manhattan from the standpoint of value and performance is a great gas range buy.

**MANHATTAN • UNIVERSAL**

*Gotham Universal*

Four Burner–16-Inch Oven – In-A-Drawer Broiler – Kitchenette Gas Range

The Gotham, occupying only 19 inches of floor space, is ideal for the kitchen of limited space. It is equipped with new "Klik-Set" Burners and full sized In-A-Drawer Broiler with new streamlined Precision Oven.

**GOTHAM • UNIVERSAL**

performance, and of particular importance, each and every unit in the 1940 line presents a new and higher standard of value per dollar of cost. Universal ranges for 1940 have been so priced as to come within the limitations of existing price brackets so as to meet the needs and requirements of all income groups. Thus, Universal for 1940 offers greater sales volume possibilities than ever before. A point of special emphasis is that each and every unit in the Universal line can be sold at a price that not only assures volume, but a reasonable profit as well. From every viewpoint, from every standpoint of consideration, Universal for 1940 is not only the best range buy for the consumer, but also for the gas utility company.

★

**GAS RANGE BUY FOR 1940**

# WORTHINGTON

## 100 YEARS

## 1840 - 1940

### "WHAT IS RIGHT WILL PROVE ITSELF RIGHT"

THUS WROTE Henry R. Worthington, a great engineer-inventor, in 1876. He continued, "I have asked for an answer to the question . . . Have I been able permanently to improve the department of engineering, in which I have steadily and exclusively worked?"

» Today, the company which he founded, its products in use in every country in the world, with plants that cover hundreds of acres, with the value of its manufactures reaching hundreds of millions of dollars, looks back over a century's span, and sees proved the essential soundness of its founder's vision and ideals.

» In its century of growth it has pioneered in many significant basic engineering developments of widespread application. Itself a pioneer, it has pushed forward shoulder to shoulder with pioneers, across continents and over the seven seas. It has witnessed the birth and growth of a new age. It has seen a whole new civilization develop, and has accepted the continued challenges of that civilization. Looking back on its rich and fruitful past, it turns to its second century confident of its ability to carry on with the splendid spirit and vision of its founder.

» Worthington's maturity finds expression in a notable group of engineering products with standards of excellence and records of performance unsurpassed in their respective fields . . . for the petroleum industry in production, transportation and refining . . . for gas and oil pipe lines and distribution . . . for refrigeration and air conditioning in every branch . . . for steam power, land and marine, including turbines, condensers, feedwater heaters and auxiliaries . . . feedwater heaters for railway locomotives . . . Diesel and gas engine units covering a wide power range . . . air and gas compressors for all industrial uses . . . a comprehensive line of contractor equipment . . . and pumping equipment whose scope is the most extensive available.

» It has been said that an institution is the lengthened shadow of a man. Perhaps more true of the Worthington Pump and Machinery Corporation than of most institutions, it yet is not the whole truth. This corporation is not only the lengthened shadow of one man, but of many men who have given the best of their keen minds and stout hearts, that their science and engineering could better serve not only their company but also the civilization of which they and it have been such important parts.

Harry G. Beaver

PRESIDENT

WORTHINGTON PUMP AND MACHINERY CORPORATION
HARRISON, NEW JERSEY

Moore Steam Turbine Division . . . Carbondale Air Conditioning and Refrigeration Division
Worthington-Gamon Meter Company

M10-1

GAS
JANUARY, 1940

# GUEST Editorial

## One of the Industry's Best Assets

By R. M. CONNER
Director, American Gas Association Testing Laboratories

OF SPECIAL significance to our many Pacific Coast friends and of general interest to the entire gas industry is the recent completion of the new Los Angeles Branch of the American Gas Association's Testing Laboratories. Whatever one's analysis may be of the benefits to our industry accruing from activities such as this new branch will engage in, it is safe to assume they might be multiplied many times and even then the valuation placed on them would still be entirely too low. It it doubtful if all the improvements brought about in the safety, convenience and economy of domestic gas appliances during the past 14 years ever can be accurately classified. A few tangible examples are an over-all average increase in thermal efficiency of about 30% for gas ranges, an approximate increase of 25% in service efficiency of automatic storage gas water heaters, and so on down the line.

The American people buy automobiles because they have been reasonably satisfied with their experiences with them in the past. So it is with every other commodity or service. Our customers will continue to use gas and its field of usefulness will expand in direct proportion to the degree of satisfaction with which it is utilized. The principal function of our Laboratories, regardless of anything that may be or has been said to the contrary, is in the last analysis to improve gas service. Notable accomplishments in such fields have been brought about as a result of continuous testing and research activities, although the task is of an endless nature and of an ever-expanding scope.

It is said that several of our most formidable competitors look with growing admiration on the American Gas Association's gas appliance testing and approval program. Privately they admit that in this respect the gas industry is in the lead. While they would like to imitate the program, for obvious reasons they do not wish to appear in the light of copying it. They will probably come to it sooner or later.

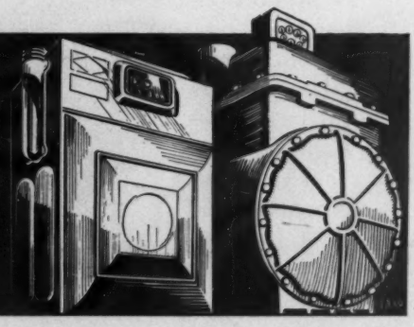
It is predicted that the gas industry's program of self-regulation in the public's interest will prove of everlasting credit to it and to its leaders who some 15 years ago were far-sighted enough to initiate this step. Since then the Association's program of research and appliance testing has undergone a steady expansion. Those of us closest in touch with its operations, however, are certain that its field of usefulness has only been partially explored and that the coming years will witness its further expansion. Certainly in our two new and well equipped Laboratories the American gas industry has something of which it may well be proud, something that will continue to strengthen its competitive position now and in years to come.

## • the beginning of a performance record

**The industry's predominant use of American Meter Company meters is of course based essentially on their performance records. • And these quality standards . . . made possible through progressive experience of more than a century in gas meter development . . . are insured only by the rigid laboratory control and precision methods maintained throughout every operation and stage of manufacture.**

GENERAL OFFICES • 60 EAST 42ND STREET, NEW YORK, N. Y.

AMERICAN
METER COMPANY
INCORPORATED (ESTABLISHED 1836)



# THERMALLY *Thinking*

**Happy New Year Everybody!**

Here we are again—you—I — the Gas Industry — the United States—the world—at the end of another year, 1939. Yesterday that year, old, broken, disillusioned, convulsively gasping for breath in a war infested world, died.

Today, another hopeful little fellow, 1940, is smiling down upon us. "I am young," he says, "I will grow, become strong. I will succor the poor and the needy, dissuade the greedy and strong, stanch the blood that flows to the east and to the west —I will succeed."

Yes, 1940, we are for you. We little people here on *G A S* Magazine are for you. We can say that our readers are for you—that the Gas industry is for you. But we cannot speak for the Hitlers, the Stalins, those men of power and might who build their egos upon the blood and bones of innocent men, women, and children. With both hope and sorrow in its heart, *G A S* wishes to all — A HAPPY NEW YEAR!

**Consider Now the Summer**

With the first fall of snow sifting down outside our window it seems a poor time to editorialize on summer air conditioning. But let's slip on our ear muffs and think about it, because it is going to be important a few months from now: 1940 is going to be the first big year for gas-fired complete air conditioning.

It is only within the past two years that complete lines of gas-fired equipment for both dehumidifying and cooling have been on the market in sizes and capacities for practically any type of installation requirement. Yet there are now over 500 installations in operation throughout the country. Most of these have been commercial and industrial installations, to be sure. But most air conditioning of *any* kind has been commercial or industrial so far. The domestic market is just beginning to open up.

Now there are about 1500 dealers in the United States handling complete air conditioning installations, and to most of these the part that gas can play in this field is news.

Manufacturers will do their share in pointing out to dealers the advantages of their own equipment. But there is a job for the utilities that can't wait until the Tom Collins season rolls around again. Every gas company that hopes to get its share of the air conditioning load should make plans to install gas-fired summer air conditioning in its own offices between now and the time when the sales supervisors' collars start to melt.

In the front, where the public is received, it will be most important; although a little summer comfort for the boys in the back room is certainly worth considering too. Imagine the inquiries that would be stimulated by lobby signs reading "Air Conditioned by Gas." Dealers that are a little slow in accepting new departures would be quick to see the advantage of a continuous local demonstration of the service they have to sell.

And from a revenue standpoint the resulting installations would be just what the doctor ordered. What could be more ideal than a seasonal off-peak load that has almost the potential of the winter heating load?

Even the combination utilities, whose executives often perspire freely as they try to decide whether to push gas sales or electric sales, would for once be out of this perennial dilemma. For the electric load, for blowers, fans and pumps, is about equal to the gas revenue, according to the engineers.

Don't look now—but isn't that Spring just around around the corner?

**On Basic Research**

The most momentous project ever to be presented to the Gas Industry is now under consideration. It is the proposal for the establishing of a Gas Industry Research Institute, so ably advanced by Frank C. Smith before the recent convention of the American Gas Association.

A questionnaire is being mailed to members of the A.G.A. to ascertain to what extent individual companies are already engaged in some form of research. These questions, if properly put and properly answered, will require the most careful consideration if the findings are to be of any value at all in charting the course of this future cooperative endeavor. It should be remembered, as Mr. Smith himself has pointed out, that experimental laboratory work in developing new equipment, or in improving the efficiency of existing equipment, is not

research. It is extremely valuable activity, but it looks only to the more effective, or to the more widespread application of gas within the framework of its present known uses.

Research cannot proceed from the simple assumption that gas is primarily a fuel. By the scientist it can only be regarded as one of the hydrocarbons that is available in great quantities and at low cost. In this capacity, and in no other, can it take its place in the chemical revolution that is sweeping the industrial world.

Fantastic and almost unbelievable commercial by-products have resulted from scientific research in other fields. Brilliant hued dyes from coal tar; silk-like thread and fabrics out of wood; door knobs and dishes out of milk; tooth brush bristles made from coal, water and air; glass with the flexibility of rubber, and rubber that replaces steel; fertilizers taken from the atmosphere; organic glass from trees; motor fuel made from sweet potatoes; and edible fats from petroleum are but a few of the more spectacular achievements.

No industry can any longer afford the luxury of basking in the security of its existing markets. Those markets literally may be swept away over night. What nylon is destined to do to silk, solar energy may some day do to the fuels of today. Fantastic? So is flying. In 1896 Professor Joseph Le Conte of California proved from unassailable calculations that the air transports that we use today would be scientific and technical impossibilities. No doubt the railroads wish the professor had been right.

Mr. Smith and the Special Committee on Fundamental Research that labored with him have presented to the industry proposals that err, if they can be criticised at all, only on the side of conservatism. The decision that any basic industry must make regarding research is not whether it is quite ready to take the step, but whether it has become too moribund to consider it.

**Public Relations**

The subject of "Public Relations" has been so well explored in the public utility industry that it would seem there is little new you could say about it. Recognizing that our greatest stock-in-trade is the opinion our customers hold of us, nobody can accuse us of being lax in this respect, judging by the continual going-over the subject gets. Yet, perhaps our great task lies, not in digging up new ideas on the subject, but in putting our present ideas to work.

For example, have you ever thought of the influence our purchasing departments can exert on our public relations? We have no desire to be persnickity or carpingly critical, but it is no coincidence, we feel, that so many of the most bitter denunciations of the gas industry we hear come from salesmen who have been roughed-up by utility purchasing departments. It is no secret that the flames of public ownership, anti-utility merchandising and more intensive fuel competition have often been fanned by appliance and equipment salesmen who have been snubbed, ritzed, poo-poohed, and mis-handled in our own purchasing departments. They have supplied much of the ammunition to anti-utility dealers, who are customers and have friends who are customers too.

Intelligent and sympathetic handling takes tact and patience. But straightening out the lack of it in our purchasing departments costs goodwill and money.

**Sales Appeal**

So long as the residential load is the basic load of our industry from an income viewpoint, it will necessarily hold the spotlight in our development programs.

Some cynic once said that no lawyer is any better than his law library. The same fellow might just as easily have said that no editorial writer is any better than his sources. Anyway, we feel tremendously obligated to our own files. Which is all a preamble to an A.G.A. interim bulletin, about which we have planned to comment for some time. In our humble opinion, it is one of the most valuable pieces of literature ever issued by the A.G.A. It is interim bulletin No. 41, entitled, "Selling the Residential Markets," and issued in 1938. It is one of those reports that a utility executive cannot ignore, we feel. It is well written, concise, and constructive.

For example, the question of the proper sales appeal to feature in gas company advertising has always been a moot one. What appeal is the most effective? Based on a field survey, the report says:

> "It is evident that gas advertising emphasizes the qualities and characteristics of the appliance. It attempts to increase the use of gas through a demand for appliances. In doing so it would seem to be attacking the problem from behind instead of from the front. Nobody on earth wants a gas range for its own sake, even the new CP range. The demand arises only because the range is useful in satisfying the human craving for appetizing food. People can and do live happily without gas ranges, but they do not live long without eating. Eating is fundamental. The gas range is only an incident in its accomplishment.
>
> "The principal of emphasizing fundamentals is perhaps best illustrated in the advertising of Life Buoy soap. The appeal is to human vanity, one of the very strongest buying motives. Only indirectly does the soap itself enter the picture, but the results apparently are continuously satisfactory. Other soap manufacturers have adopted the Life Buoy tactics unanimously. Soap is no longer so much vegetable or animal fat. It is an agency for preserving self-respect and the admiration of one's friends. It does things vital to the human heart.
>
> "Gas can also be made to do things vital not only to the heart but to other equally important organs. It can be used to cook food. The slogan suggests itself, 'If you want to eat well, eat home.' Gas can produce hot water, the liberal use of which promotes health and comfort and overcomes B. O. Advertise 'If you want to keep well, Keep Clean.' Gas will keep you warm. Millions are spent on cough medicines each winter which could possibly be diverted to gas by proclaiming, " 'Keep Warm and Stay Well.' "

The above is a meaty sample of this bulletin. It belongs on every utility sales executive's desk.

By J. H. REED
Atlanta, Georgia

Lighting the historic gas street lamp during the "Gone With the Wind" celebration staged in Atlanta, Ga., last month.

# A LIGHT

## That Has Not Failed

WHAT is believed to be the only lamp post memorial in the world was dedicated in Atlanta, Ga., on December 14, as the first official ceremony in Atlanta's "Gone with the Wind" celebration.

Installed late in 1855 and lit for the first time on Christmas Day of that year, the light was struck and damaged by a shell from General Sherman's artillery; retained in its original position for a period of more than 80 years; made a memorial to a prominent Confederate war veteran, and has now been restored by the Atlanta Gas Light Co. as a perpetual light to the Confederacy.

Replica of one of Atlanta Gas Light Co.'s newspaper advertisements which ran during the recent "Gone With the Wind" celebration.

It might, with equal truth, be said to symbolize 84 years of service given by the Atlanta Gas Light Co. to the people of Atlanta, a service broken only when Sherman destroyed the gas works and resumed within a year after his armies had burned and left the city.

But back of this historic lamp post lies an interesting story for all gas men.

As early as March, 1853, 15 years before the establishment of the State Capitol in Atlanta the question of lighting the city's streets came up in the city council.

At that time, oil lamps were installed at such locations as citizens were willing to keep them filled, trimmed and properly lit at night. One year later, Messrs. Perdieu and Hoyt offered to put in a coal gas plant, but the offer was not accepted. But in 1855, William Helme, of Philadelphia, made the council a proposition.

It was to erect a coal gas plant, lay mains in the streets and alleys of the city, and have the exclusive privilege of lighting the streets for a period of 50 years. The gas works were, furthermore, to be of sufficient capacity to manufacture 20,000 cu. ft. of gas daily. The council was to secure and erect at least 50 street lamps and pay for lighting them at the rate of $30.00 per annum. The cost of the gas company was estimated to be $50,000, and the city was to take $20,000 of the gas company's stock, paying for it in bonds bearing 7% interest. The property of the gas company was to be free from taxation.

A cautious committee from the city council "sounded out" the Atlanta public and reported it was almost unanimously in favor of the proposition.

So the contract was signed.

Thereupon the city contracted with the Schofield Iron Works, at Macon, Ga., to cast and deliver to it, on or before October 1, 1855, 50 "ornamental lamp posts including lamps and burners." The cost was $21.00 per post.

The lamp posts were duly received and installed. A gas plant was constructed on Marietta street and the mains laid. And on Christmas Day, 1855, the lights were turned on for the first time, with a celebration almost equalling that of "Gone with the Wind."

For nine years the original 50 lamp posts gave good service and were augmented by other lamp posts—though without the eagle atop—making Atlanta, for its day, an exceptionally well lit city. Then General Sherman laid siege to the city. After several weeks of desultary shelling with lighter artillery, Sherman then brought up the "Big Berthas" of his day, a battery of

30-lb. Parrott cannons, and Atlanta began to learn what war . . . and hell . . . might be like.

Superintendent Warner of the gas company, and his six-year-old daughter were killed when a shell struck a house in which they had taken refuge. Scarcely a building in the Alabama and Whitehall street business district escaped damage. And a shell, striking a lamp post at the corner of Whitehall and Alabama streets, damaged it, killing one man, a barber named Sol Luckie, and injuring several others.

This is the lamp post which the gas company has restored and which has been dedicated as a memorial.

Set up again after the bombardment and burning of the city, it remains serene in its original location, one of the few landmarks of the war to remain in place.

It has remained on its corner through the advent of electric street lights, the building of the Whitehall Street viaduct and later of the Alabama, Bryor and Wall Street viaduct system, and the construction of the Atlanta National Bank Building.

Some years ago, the Old Guard of Atlanta, in cooperation with the Atlanta Chapter of the U.D.C., placed a bronze shield on the battered old lamp post as a memorial to the late Col. A. J. West, a beloved veteran and citizen. The shield remains as part of the lamp post. Now the restored light will burn continuously as a memorial to the Confederacy as well; an unusual contribution to the community from its gas company.

To restore the old light, much research had to be done. But from old drawings and descriptions, the company was able to reproduce the globe and burner accurately, even to the eagle which tops it. Workers drilled through solid cement to lay the gas pipe to the post.

And it will serve, among other things, to remind the people of Atlanta of a gas service which it took an invading army to interrupt and which has been continuous for 75 years.

# Revenues and Appliance Sales Show 1939 Upturn

ACCORDING to statistics recently released by Paul Ryan, chief statistician of the American Gas Association, revenues of manufactured and natural gas utilities amounted to $55,470,000 in September, 1939, as compared with $53,598,200 for the corresponding month of 1938, an increase of 3.5%. An increase of 2.0% in the total number of gas customers was noted in September, 1939, over the total in September, 1938. For the first nine months of 1939, ending September 30, the revenues of manufactured and natural gas utilities amounted to $606,791,500 in comparison with a total of $576,360,100 for the same period in 1938, an increase of 5.3%.

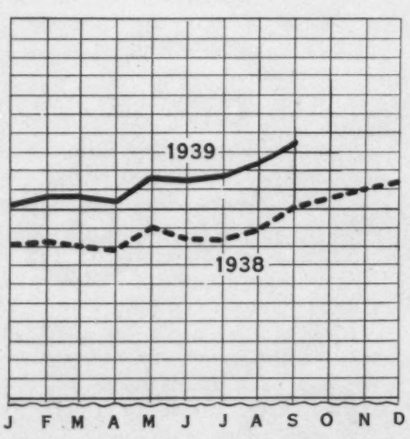
Gas appliance sales throughout the country registered a substantial increase during the first 10 months of 1939 as compared to the same period in 1938, with sales in October, 1939, greatly exceeding those of October, 1938, it has been reported by C. W. Berghorn, managing director of the Association of Gas Appliance and Equipment Manufacturers.

An increase of 44.9% in gas house heating equipment sales has been noted during the first 10 months of 1939 as compared to the same 1938 period. October, 1939, sales of gas house heating equipment were 59.5% higher than October of the preceding year.

For the first nine months of 1939 shipments of central heating gas appliances, such as boilers, furnaces and conversion burners, registered a 42% increase over the same period in 1938.

While sales of gas water heaters increased 28.6% for the 10-month period of 1939 as compared to 1938, October, 1939, figures show a rise of 40.6% as compared to October, 1938. For the first nine months of 1939 the ratio of gas water heater shipments to electric water heater shipments shows 5.14 gas to 1 electric, as compared with a ratio of 5.52 gas to 1 electric for the same period of 1938.

Domestic gas range sales increased 31.6% for the first 10 months of 1939 and registered a rise of 25.6% during October, 1939, as compared to the same 1938 month. Further, the ratio of gas range shipments to electric range shipments for the first nine months of 1939 stands at 4.04 gas to 1 electric, as compared with a ratio of 3.64 gas to 1 electric for the same period of 1938.




**American Gas Association chart showing domestic gas customers served in 1938 as compared to 1939. (Millions of customers.)**

## Frank B. Long Will Head Oklahoma Utilities Group

AT a meeting in Tulsa, Okla., December 14, the Oklahoma Utilities Association elected officers for 1940 and made preliminary arrangements for the next annual convention of the organization, to be held at Oklahoma City, on tentative dates of March 18 and 19, 1940.

Frank B. Long, vice president, Oklahoma Natural Gas Co., Tulsa, was elected president of the association, succeeding Glenn C. Kiley, Oklahoma City, western division manager, Oklahoma Gas and Electric Co.

Other officers elected, to assume their duties immediately, are: R. K. Lane, Tulsa, president, Public Service Co. of Oklahoma, first vice president; W. L. Woodward, Alva, president, Zenith Gas System, Inc., second vice president; W. R. Emerson, Oklahoma City, vice president and treasurer, Oklahoma Gas and Electric Co., treasurer; Kate A. Niblack, Oklahoma City, secretary.

Seven members of the board of directors of the assocation were elected. *Three-year term:* Geo. A. Davis, Oklahoma City, vice president, Oklahoma Gas and Electric Co.; C. A. Breitung, Ada, vice president, Southwest Natural Gas Co. *One-year term:* S. I. McElhoes, Chickasha, vice president, Southwest Light & Power Co.; A. F. Potter, Bartlesville, manager, The Gas Service Co.; J. C. Happenny, Sand Springs, president, Oklahoma Power and Water Co.; W. L. Woodward and Frank B. Long.

R. K. Lane was appointed chairman of the convention committee to arrange for the annual convention.

## Laboratory Body Approves Requirement Revisions

The American Gas Association Approval Requirements Committee has approved recommended revisions for requirements for central heating appliances, clothes dryers, hot plates and laundry stoves, ranges, space heaters and unit heaters.

New markings on name plates for various appliances will indicate exactly how the equipment was tested in the Laboratories. For example, insulated ranges will be marked "insulated" to indicate that ovens are completely insulated, and comply with the wall temperature tests when installed closer to the walls than uninsulated ranges. Thus, this marking will also serve as a guide for the proper installation of domestic gas ranges. Warm air furnaces will be marked to indicate whether they were tested in the Laboratories as gravity or forced-air units.

# METHODS FOR ESTIMATING THE CORROSIVITY OF SOILS

By K. H. LOGAN and E. A. KOENIG*

K. H. LOGAN

E. A. KOENIG

**THE PREDETERMINATION of the corrosivity of soils through which a pipe line is to be laid is obviously desirable so that, first, the line can be adequately protected where necessary, and, second, no needless expenditure made in areas where no corrosion hazard exists. Similarly, a soil survey of a previously installed pipe line route or pipe network, if dependable, will indicate the areas where corrosion difficulties may be anticipated or reconditioning activities directed.**

**Numerous tests have been devised for estimating the corrosivity of soils in relation to buried pipes, but there is a lack of factual information as to their effectiveness, due, in part, to the wide variety of soils and other variables encountered in the shallow zone where most pipes repose, and in part to the tendency to attempt wide and universal application of the several methods rather than to develop them for specific regional use. Because these procedures are still in a development stage, soil survey programs and interpretation of results should always be under the supervision of an engineer experienced in such work.**

**GAS herewith presents portions of a paper, "A Comparison Method for Estimating the Corrosivity of Soils," which was presented by Messrs. Logan and Koenig before the Twentieth Annual Meeting of the American Petroleum Institute at the Stevens Hotel, Chicago, Ill., November 16, 1939. This work is particularly interesting in that it affords an opportunity for comparison of the many currently used methods with actual corrosion data on operating lines.—(Abstract by GAS).**

IN 1937 the Magnolia Pipe Line Co.† exposed approximately 25 miles of an 8-in. asphalt-coated steel line in southeastern Texas; measured the depths of the deepest three pits on each joint of pipe; and estimated the condition of each joint. The resistivity of the soil at pipe depth was determined at approximately 200-ft. intervals. The soils along the right-of-way were mapped, by R. L. Phillips, according to methods established by the U. S. Department of Agriculture. Phillips described the soils, and took approximately 250 samples of soil at pipe depth. A part of each sample was tested in the field, and another part was forwarded to the National Bureau of Standards for further investigation. In this paper the results of tests of these samples are compared with pit depths which are taken as the measure of the corrosiveness of the soils.

For many years the U. S. Department of Agriculture has been engaged in a survey of the soils of the United States. Between a third and a half of the country has been mapped. A soil type is a soil unit based on uniformity of all soil characteristics, and is designated by the series name and a texture description. All soil units in which all soil characteristics except the texture of the surface horizon are uniform are grouped into a series. For example, in Norfolk sandy loam the textural designation refers to the surface layer or horizon, and the name Norfolk refers to the series.

It is reasonable to suppose that all soil sufficiently uniform to be classed as one type, or possibly as a whole series, would have a characteristic corrosiveness.

The following test methods were used to evaluate the corrosiveness of the soils:

*Mr. Logan is affiliated with the National Bureau of Standards, Washington, D. C.; Mr. Koenig with the Magnolia Pipe Line Co., Dallas, Texas.

†Publication approved by the director of the National Bureau of Standards, Washington, D. C.

*1. Soil Resistivity (Shepard Resistivity Meter):* Insofar as corrosion is an electrochemical process, it is affected by two factors: 1, the driving force or difference of potential between anodic and cathodic areas; and 2, the forces opposing this tendency. The opposing forces are chiefly the electrical resistance of the electrolyte and the counter-electromotive force, commonly known as polarization. One or another of these factors may control the rate of corrosion. The presence of soluble salts is indicated by low resistivity of the electrolyte or soil solution. This probably accounts, indirectly at least, for the development of simple tests for soil corrosivity based only on the measurement of the resistivity of the soil.

Of the many pieces of apparatus with which such a measurement can be made, Shepard's resistivity meter[9] is perhaps the simplest and most frequently used. Two steel-tipped rods are thrust into the soil 6 in. or more apart, and the current which a three-volt battery caused to pass between them is measured by a milliammeter calibrated to read resistivity in ohm-centimeters. To minimize polarization, which usually affects direct-current measurements of the resistance of an electrolyte, the cone connected to the negative side of the battery is made much larger than the other one. This design was based on the experience that in most soils most of the polarization occurred at the cathode.

*2. Soil Resistivity at Moisture Equivalent:* Three possible sources of error might account for an imperfect correlation between the soil resistivity as measured by Shepard's resistivity meter and corrosion: 1, poor contact between the electrodes and the soil; 2, polarization resulting from the use of direct current; and, 3, measurement of resistivity at a time when the soil contained more or less moisture than normal. The first two of these possible errors would result in too high values for resistivity. To determine the extent of these errors, water was added to the air-dry samples of soil to bring them to the moisture equivalent, which is the amount of moisture retained by the

TABLE NO. 1. COMPARISON OF METHODS OF TESTING SOILS ON BASIS OF CORRECT ARRANGEMENT OF SOILS IN THE RANK OR ORDER OF CORROSIVENESS

| Soil Series | Rank: By Adjacent Pit | Rank: By Average Pit | Shepard Resistivity Meter: Deviation: By Adjacent Pit | Shepard Resistivity Meter: Deviation: By Average Pit | Shepard Resistivity Meter: Rank | Resistivity-at-Moisture Equivalent: Deviation: By Adjacent Pit | Resistivity-at-Moisture Equivalent: Deviation: By Average Pit | Resistivity-at-Moisture Equivalent: Rank | Total Acidity: Deviation: By Adjacent Pit | Total Acidity: Deviation: By Average Pit | Total Acidity: Rank | Acidity Times 1,000 ÷ Resistivity: Deviation: By Adjacent Pit | Acidity Times 1,000 ÷ Resistivity: Deviation: By Average Pit | Acidity Times 1,000 ÷ Resistivity: Rank | Modified Columbia Rod Test: Deviation: By Adjacent Pit | Modified Columbia Rod Test: Deviation: By Average Pit | Modified Columbia Rod Test: Rank | Putnam Test: Deviation: By Adjacent Pit | Putnam Test: Deviation: By Average Pit | Putnam Test: Rank | Nipple-and-Can Test: Deviation: By Adjacent Pit | Nipple-and-Can Test: Deviation: By Average Pit | Nipple-and-Can Test: Rank | Denison Electrolytic Cell: Deviation: By Adjacent Pit | Denison Electrolytic Cell: Deviation: By Average Pit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acadia | 11 | 9 | −2 | 0 | 9 | −6 | −4 | 10 | −1 | +1 | 11 | 0 | +2 | 10 | −1 | +1 | 8 | −3 | −1 | 10 | −1 | +1 | 9 | −2 | 0 |
| Brown | 8 | 7 | +3 | +4 | 11 | +3 | +4 | 4 | −4 | −3 | 5 | −3 | −2 | 9 | +1 | +2 | 11 | +3 | +4 | 9 | +1 | +2 | 6 | −2 | −1 |
| Caddo | 4 | 3 and 4 | −3 | −2 | 1 | −3 | −2 | 6 | +2 | +2 | 1 | −3 | −2 | 1 | −3 | −2 | 1 | −3 | −2 | 1 | −3 | −2 | 3 | −1 | 0 |
| Conglomerate | 9 | 11 | −2 | −4 | 7 | −1 | −3 | 1 and 2 | −7 | −9 | 3 | −7 | −8 | 3 | −6 | −8 | 7 | −2 | −4 | 11 | +2 | 0 | 11 | +2 | 0 |
| Crowley | 7 | 8 | −3 | −4 | 4 | 0 | −1 | 9 | +2 | +1 | 8 | +1 | 0 | 8 | +1 | 0 | 4 | −3 | −4 | 2 | −5 | −6 | 8 | +1 | 0 |
| Dark brown | 1 | 3 and 4 | −1 | −1 | 2 | +3 | 0 | 1 and 2 | 0 | −1 | 2 | +1 | −1 | 5 | +4 | +1 | 3 | +2 | 0 | 5 | +4 | +1 | 1 | 0 | −2 |
| Lake Charles | 10 | 10 | −2 | −2 | 8 | −1 | −1 | 8 | −2 | −2 | 12 | +1 | +2 | 11 | +1 | +1 | 10 | 0 | 0 | 7 | −3 | −3 | 10 | 0 | 0 |
| Leaf | 6 | 6 | 0 | 0 | 6 | 0 | 0 | 12 | +4 | +4 | 9 | +3 | +3 | 6 | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 4 | −2 | −2 |
| Light gray | 12 | 12 | 0 | 0 | 12 | 0 | 0 | 3 | −9 | −9 | 10 | −2 | −2 | 12 | 0 | 0 | 12 | 0 | 0 | 12 | 0 | 0 | 12 | 0 | 0 |
| Myatt | 2 | 2 | +8 | +8 | 10 | +8 | +8 | 5 | +3 | +3 | 6 | +4 | +4 | 7 | +5 | +5 | 9 | +7 | +7 | 3 | +1 | +1 | 7 | +5 | +5 |
| Ochlockonee | 3 | 1 | 0 | +2 | 3 | −1 | +1 | 11 | +8 | +10 | 7 | +4 | +6 | 2 | −1 | +1 | 2 | −1 | +1 | 4 | +1 | +3 | 2 | −1 | +1 |
| Segno | 5 | 5 | 0 | 0 | 3 | −2 | −2 | 7 | +2 | +2 | 4 | −1 | −1 | 4 | −1 | −1 | 5 | 0 | 0 | 8 | +3 | +3 | 5 | 0 | 0 |
| E | .. | .. | 24 | 27 | .. | 28 | 26 | .. | 44 | 47 | .. | 31 | 33 | .. | 24 | 22 | .. | 24 | 23 | .. | 24 | 22 | .. | 16 | 11 |
| Rank | .. | .. | 2 | 6 | .. | 6 | 5 | .. | 8 | 8 | .. | 7 | 7 | .. | 2 | 2 | .. | 2 | 4 | .. | 2 | 2 | .. | 1 | 1 |

soil when saturated soil is subjected for one hour to a centrifugal force of 1000 times the force of gravity. This treatment reduces soils to their normal moisture content except in cases in which the water table is high. The resistivity of the moist sample then was measured by means of a thousand-cycle current.

*3. Soil Acidity:* Denison and Hobbs[11] have shown that there is a relation between the total acidity of acid soils and their corrosiveness, and Denison[12] has described a method for measuring soil acidity. Ewing[3] has developed a more rapid, although slightly-less accurate, method.

*4. Acidity-Resistivity Test:* For an old pipe-line system in northern Ohio Ewing[3] found that an equation involving both soil acidity and soil resistivity represented the cost of maintaining the pipe line better than equations involving either of these factors alone. The equation is:

$$C = \frac{k\,(\text{acidity} - 5)}{\text{resistivity}}$$

*Where: C* is the annual cost of maintaining a bare pipe line by repairing leaks and by reconditioning; *k* is a constant depending on unit costs, the pipe-line diameter, and wall thickness. The acidity is expressed in milligram equivalents per 100 grams of soil, and the resistivity in ohm-centimeters at 60 deg. F. (15.5 deg. C.) for the saturated soil. The equation, obviously, is not applicable to soils which have an acidity less than 5 milligram equivalents; and, therefore, it is not applicable to the soils on this pipe line—many of which have acidities below this value.

The expression

$$\frac{\text{"1000 times acidity"}}{\text{resistivity}}$$

was therefore used in this instance.

*5. The Columbia Rod Test:* Legg[13] has developed an apparatus known as the Columbia rod for determining the corrosivity of soils. This apparatus avoids the use of an external battery and a voltage higher than would develop usually between two nearby points on the surface of a pipe. It consists of a tube, on the pointed lower end of which are two rings or a ring and a metal point—one of ferrous and the other of non-ferrous metal, insulated from each other and from the rod. The rod is driven into the soil or thrust into a suitable hole, and the current which flows is measured by a milliammeter connected between the electrodes.

In the present study the Columbia rod was not used in the field. To get some idea of the results which might be expected from such apparatus, a bakelite frame was constructed which held a copper and an iron electrode 3 cm. apart. These electrodes were intended to serve the same purpose as the electrodes of the Columbia rod. The area of each electrode was 30 sq. cm., which was about half the area of the electrodes on one of the earlier forms of the Columbia rod. Soil at moisture equivalent was packed between the electrodes, a milliammeter was connected between them, and the average current over a period of 5 min. was determined. This current was taken as a measure of the corrosivity of the soil.

*6. The Putnam Test:* Putnam's[14 15 16] methods for determining soil corrosivity were among the first to give consideration to factors in corrosion other than resistivity. An attempt is made to take account of the potential of the soil with respect to the pipe and polarization as well as soil resistivity. The method in practice consists of observing the current which will flow across a 1-in. cube of soil subjected to a potential of 1.4 volts, although nothing in the theory of the test precludes the use of another volume of soil if the observed current is corrected for the difference in the resistance of the circuit. In the test as conducted at the bureau, soils at moisture equivalent were tested by means of the container used in the Columbia rod test, except that a steel plate was substituted for the copper electrode. To reduce the currents obtained to those obtainable with Putnam's apparatus, the currents should be divided by 3.9. There was slightly less polarization with the bureau's apparatus because of the slightly greater distance between the electrodes.

*7. The Nipple-and-Can Electrolytic Test:* The essential features of one of the most widely-used tests for soil corrosivity were described by Williams[17] in 1927. This test has been studied and modified by Corfield.[18] The test consists of determining the loss of weight of a 3-in. length of ¾-in. steel pipe caused by the passage of current at 6 volts. The pipe is surrounded by saturated soil contained in a can about 3 in. in diameter. Lack of soil makes it impossible to use an anode as long as Corfield's, but the diameters of the rod and can and the period of exposure were the same as in his test. Consequently the current density, polarization, and heating effects were approximately the same as in his tests.

*8. The Denison Electrolytic Test:* A newer and more elaborate test intended more nearly to simulate the conditions under which corrosion in soils occurs has been proposed by Denison. The method is in the process of development, and the apparatus and the methods to be employed have been described in several papers ([4 19 20 21]) with slight differences due to improvements.

The essential features of the test are that the corrosivity of soil samples is determined from the relation between current density and potential in a cell in which the anode is a steel disc and the cathode a steel screen. The soil is especially-prepared, and a variable current from an outside source is applied between the electrodes.

The Denison test requires somewhat more care in the preparation of the soil samples than is required by the other tests, and slight errors in the manipulation of the test may cause large errors in the results. For this reason the test was run in duplicate, and re-run if the results did not check within 20%. In addition to this, the tests were repeated on soils for which the dispersion of the data was unusually large. It is possible that the simplicity of the other tests renders their duplication less necessary. However, the repetition of the Denison tests naturally would yield results more truly representative of the method than those obtained from single trials of the other methods. For this reason the results of the Denison test should be regarded as a demonstration of what can be done with this method rather than of its merits in comparison with other methods.

### Correlating the Data

Fig. 1 and Fig. 2 show the correlation of the data from these various test methods, with maximum pit depths on the joints of pipe adjacent to the soil samples. The figures indicate that there is not a great deal of difference in the degree of correlation of the results of most of the tests with pit depths. The most important conclusions from this treatment of the data are that, when treated in the ways described, the results are similar. All methods show in a very general way the corrosiveness of the soil samples; but whenever several test results having the same value were obtained, widely-divergent pit depths are associated with them. There appears to be no fixed relation between the result of the tests and the maximum pit on the joint of the pipe line nearest the sample tested. This may be due to the

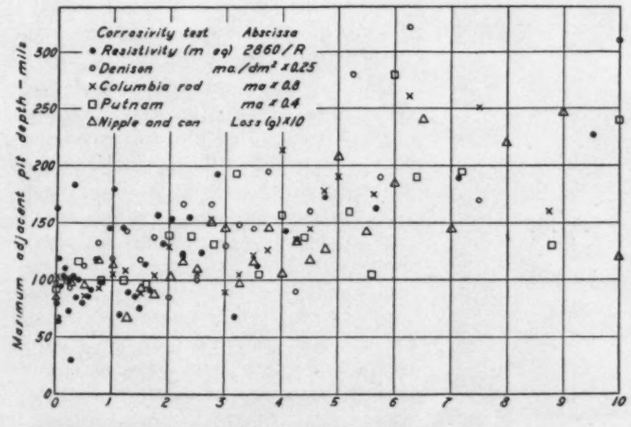



FIG. 1. Comparison of average values for resistivity, Denison, Columbia Rod, Putnam, and nipple-and-can tests with maximum pits.

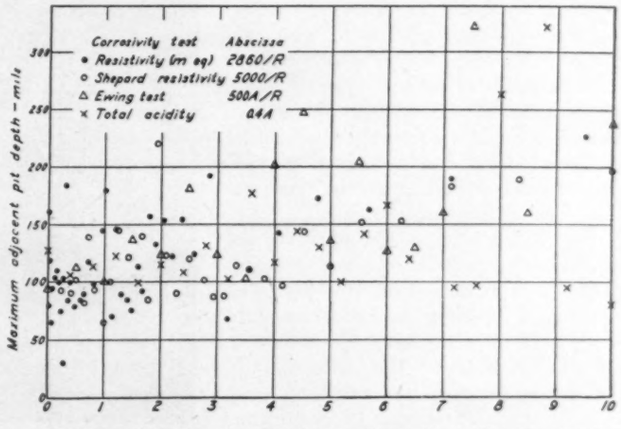



FIG. 2. Comparison of average values for resistivity, field resistivity, total acidity, and acidity-resistivity tests with maximum pits.

inadequacy of the tests, the improper sampling of the soil, or the unrepresentative character of the pit depth chosen as the indication of the corrosiveness of the soil.

Table No. 1 shows the relative merits of the test methods on the basis of the success with which the tests assign each of the several soil series in the rank or order of their corrosiveness. A zero indicates perfect agreement between pit depth and test data as to the rank to which the soil series belongs. A minus sign indicates that the test underestimates the corrosivity of the soil and the number following shows how large the error was.

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# Cities Service Standardizes Pipe Line Road Crossings

CITIES Service Gas Co. has adopted a standard type of construction for all road crossings, which combines a measure of safety and provides interchangeability with a high salvage value. The type adopted some time ago is used where any or all gas transmission pipe lines are buried beneath highways, whether paved, graveled or merely unimproved arteries of travel. Previous to the development of the type now in use, the road crossings were of a design decided upon by the foreman in charge of the work of laying the line, and differed in many respects from others at crossings in adjoining states. The new type is made up as a standard, and provides a protective casing to support the weight of the overburden and prevent escape of gas, should a leak occur in the pipe line carried through the casing.

The casing used as a conduit for the pipe line proper is, obviously, larger than the pipe line itself. For example, when an 8-in. pipe line crosses a highway, a 10-in. size casing is provided. In all installations, the difference in the size of the pipe line and the casing is approximately 2 in. The casing is made up of sound pipe salvaged from abandoned systems, or taken from stores near the point of utilization, and the transmission portion of the crossing is always new, heavy pipe, designed for many years of service without deterioration. When the soil in which the crossing is placed is full of "hot spots," protective precautions are taken, but in favorable situations the pipe and casing are left bare.

The casing is trucked to the point of use in lengths which are conveniently handled on the spot, and which have been cleaned, and cut with plain ends, or beveled ends where welding is expected. The entire length of casing is welded in the field and the transmission section of the pipe line also joined by welding and pulled through the casing with approximately a half joint showing at both ends.

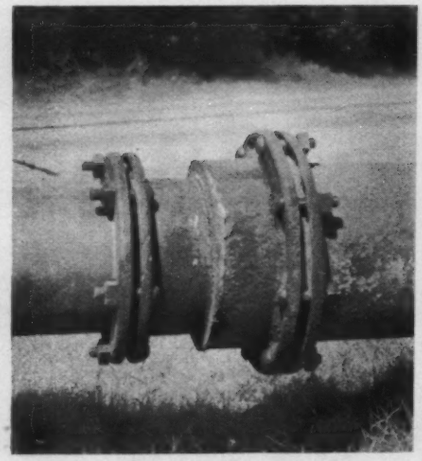


**FIG. 1. Coupling used on road crossing conductors for pipe lines, showing completed joint where pipe enters casing.**

For a coupling to seal off the casing and provide a gas-tight joint between the 10-in. casing and the 8-in. pipe line, plain long sleeve bolted couplings are used. They may be either new or used, but in all instances are in good condition before using. One 10-in. long sleeve and one 8-in. long sleeve are selected, cut in half in the center of the body, removing the indented ring which normally is installed at the junction of two sections of pipe.

In the case of a 10-in. conductor being used for the road crossing, the half of the 10-in. coupling is slipped over a short piece of the same size pipe as a mandrel. A flat piece of boiler or tank steel is placed over the end of the sleeve and welded outside securely. It is then trimmed to conform to the outer surface of the section of sleeve so a smooth joint is obtained. The next operation includes placing the 8-in. half sleeve on the flat cover of the 10-in. and marking out a circle which is the same size as the 8-in. section. A circular section is then removed by cutting with an acetylene torch, leaving a concentric ring attached to the 10-in. sleeve. Into the opening provided, the 8-in. half sleeve is inserted and welded.

Upon completion, there is presented a reducing sleeve, 8 in. on one end and 10 in. on the other, each with its bolting ring in place. When applying in the field, the 10-in. is slipped over both the 8-in. and 10-in. pipe until the end of the 10-in. is snug against the concentric ring joining the two half sleeves. The companion rings, and accompanying rubbers are, obviously, slipped in position so bolting may complete the application. (See Fig. 1.)

Vent pipes are attached to each end of the 10-in. casing after the completed unit has been rolled into the excavated ditch, rising above the normal surface of the ground. The top part of each riser contains threads, to which couplings and fittings may be attached. Should a leak occur in the walls of the 8-in. inside the 10-in. casing, the fittings are removed from the vent pipes and a collar and bull plug, or a gate, are attached to seal the assembly against the escape of gas to the atmosphere. Both the 10-in. and 8-in. sections then become a working part of the transmission system without costly excavation and extensive repairs.

## A Review of Southern Union Gas Company's Sales Boosting

# Employe Merchandising Campaigns

By CRAIG ESPY

THE declining gross revenue in 1933 of Southern Union Gas Co. caused the company to reverse its merchandising policy in July, 1934, to that of aggressively merchandising appliances through employe selling. This about-face in the sales program led to the Dallas company's gross revenue being increased from $1,250,000 to $2,250,000 in the next five years' time. The company sales record is shown on the chart, Fig. 1.

Prior to July, 1934, the company, which embraces New Mexico Gas Co., New Mexico Eastern Gas Co., Arkansas Western Gas Co., Southern Union Utilities Co., Southern Union Production Co., and Quanah Water Co., did not aggressively merchandise but depended mainly upon its dealers for appliance selling. The 1933 gas sales dropped below 1932 gas sales. This was taken by the company as the signal to change its style of selling.

Since the company began aggressively to merchandise, employes have sold in a single year's time more merchandise than had been sold in the entire six-year history of the company prior to the change.

In one 10-day period in 1935, employes sold $122,176.27 in gas appliances, which exceeded by 57 per cent the entire year's sales in 1933.

As is seen in Table No. 1, employes sold in 1936, 1937, 1938 a total of 3192 water heaters, 4334 space heaters, 1642 circulators, 1408 floor furnaces, radiators and unit heaters, and 409 central furnaces and conversions for a total of 16,036 unit sales of appliances. The average number of meters in service for this period was 16,083, so approximately one appliance per customer was sold during the period. Total sales for the four-year period commencing in 1935 amounted to $94.94 per customer. (Table No. 2.)

The comparative summary of directly and indirectly connected gas and water meters at the end of each of the past seven fiscal years is shown in Table No. 3.

Total gas appliances sold in the five-year period amount to $1,608,326.87, the appliance department making a net profit of over $80,000 on the sales. Employes of the company earned $33,478.97 in cash awards above their salaries in making the sales. They also earned for themselves many merchandising awards.

The 21 campaigns held during the five-year period attracted the participation of 78.4 per cent of the company's eligible employes. These are briefly described:

*On to the World's Fair:* (July 1 to Sept. 30, 1934.) Three round-trip tickets to World's Fair, Chicago; $25 in cash and 10 days off with pay to three highest employes based on 10 cents per point for following points: new meter, five points; unit heater, central furnace, conversion burner, four points each; water heater, circulator, radiator, floor furnace, three points each; space heater, range refrigerator, two points each. Total sales, $85,130.60.

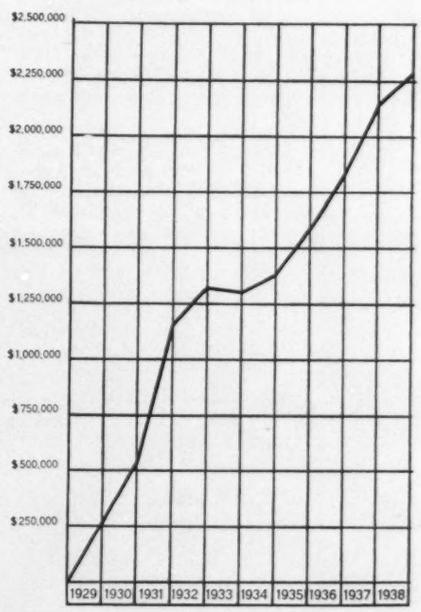



**FIG. 1. Graph showing the gross revenues of the Southern Union Gas Co. and its subsidiaries.**

*Cash for Christmas:* (Oct. 1 to Dec. 15, 1934.) Employes to be paid $1000 on point percentage basis. New meters, 10 points; reconnects, six points; unit heaters, central furnaces, conversion burners, four points each; water heaters, circulators, radiators, floor furnaces, ranges, three points each; refrigerators, space heaters, coffee urns, two points each; gas lights, one point. Total sales, $51,442.22.

*Ninety-day Campaign:* (March 1 to May 30, 1935.) One thousand dollars to be paid by company on point percentage basis on practically the same basis as the above campaign. Total sales, $95,648.91.

*Vacation Fund Contest:* (June 1 to Aug. 1, 1935.) Ten cents per point; points same as 90-day campaign. High point employe in South Texas and Arkansas, trip to New Mexico properties. In New Mexico and West Texas, trip to Arkansas properties and $50 and 10 days off with pay. Total sales, $42,646.

*Sixty-day Heating Campaign:* (Aug. 1 to Sept. 30, 1935.) Ten cents per point, same basis two previous campaigns. Total sales, $163,355.12. Sept. 19 to 30, Special Ten-day Red Tag Sale.

*Christmas Bonus Campaign:* (Dec. 6 to 21, 1935.) Five per cent of total appliance sales during period to be divided equally among all regular employes. Total sales, $19,496.23.

*Spring Clean-up Campaign:* (Feb. 21 to March 31, 1936.) Employes to get $1 each for water heaters and ranges sold. Total sales, $25,192.

*New Meters and Combination Sales:* (May, 1936.) Employe to receive $2 for each new service; $2 for each combination sale of range and water heater. Total sales, $7050 (estimated).

*Centennial Vacation Contest:* (June 1 to July 31, 1936.) Two cents per mile for:

| *Appliance* | *Miles* | *Appliance* | *Miles* |
|---|---|---|---|
| New water meter | 71 | Water heater | 20 |
| Reconnect | 50 | Range | 20 |
| New gas meter | 50 | Circulator | 15 |
| Reconnects, gas | 30 | Radiator | 15 |
| Unit heater | 20 | Floor furnace | 15 |
| Central furnace | 20 | Refrigerator | 15 |
| Furnace conversion | 20 | Space heater | 10 |
| | | Laundry stove | 10 |

Three free trips to Dallas Centennial. Total sales, $44,723.77.

*More Cubic Feet Campaign:* (Aug. 10 to Sept. 30, 1936.) Pay two cents per M c.f. of load added or retained. Total sales, $124,368.

*Seek, Sell and Share Campaign:* (Nov. 16 to Dec. 15, 1936.) Five per cent of total appliance sales during above period to be divided among all regular employes. Total sales, $62,236.60.

**TABLE NO. 1. UNIT SALES OF APPLIANCES**

**(1936, 1937, 1938)**

| *Appliances* | *1936* | *1937* | *1938* | *Total 3 Years* |
|---|---|---|---|---|
| Ranges | 1,823 | 1,591 | 1,637 | 5,051 |
| Water heaters | 1,001 | 1,291 | 900 | 3,192 |
| Space heaetrs | 1,672 | 1,661 | 1,001 | 4,334 |
| Circulators | 478 | 693 | 471 | 1,642 |
| Floor furnaces, radiators and unit heaters | 449 | 481 | 478 | 1,408 |
| Central furnaces and conversions | 140 | 144 | 125 | 409 |
| TOTALS | 5,563 | 5,861 | 4,612 | 16,036 |
| | *1936* | *1937* | *1938* | *Average 3 Years* |
| Meters in service | 14,096 | 16,261 | 17,893 | 16,083 |

**TABLE NO. 2. PERCENTAGE OF CUSTOMERS SOLD AND SALES PER CUSTOMER**

**(1935, 1936, 1937, 1938)**

| | *1935* | *1936* | *1937* | *1938* | *Total* |
|---|---|---|---|---|---|
| Average meters | 13,094 | 14,096 | 16,261 | 17,893 | 15,336 |
| Percentage of customers sold | ..... | 39.5% | 36% | 26% | 104.6%* |
| Sales per customer | $24.87 | $26.70 | $25.02 | $19.41 | $94.94 |

*Three years period.

*Water Heater Campaign:* (Feb. 16 to May 14, 1937.) Employes to receive $1 for each sale. Total sales, $15,370.

*Second Annual Vacation Fund Contest:* (May 15 to June 30, 1937.) Two per cent of total sales of ranges and water heaters to be awarded eligible employes. Must sell $100. One per cent to employes, one per cent to fund, two per cent of salesmen's sale to fund. Total sales, $99,456.15.

*Heat for Health Campaign:* (Sept. 17 to Oct. 30, 1937.) Ten cents per point; 20 cents per point on all points when employe reaches 75; one-third to district common fund to be divided among employes in each district. Salesmen's earnings to common fund. Total sales, $61,976.31.

*Cash for Christmas:* (Nov. 18 to Dec. 18, 1937.) All field employes to share equally in 5 per cent of appliance sales during period to $60,000, and equally in 10 per cent of all over that. Total sales, $64,808.66.

*Third Annual Vacation Fund Campaign:* (June 17 to July 20, 1938.) Two per cent of total sales to be divided among employes. Must sell $100. Also $2 for new meters. Total sales, $104,080.70.

*Heat for Health Campaign:* (Aug. 20 to Sept. 30, 1938.) Two per cent of total merchandise sales shared among eligible employes. Employe must be instrumental in securing gross sales amounting to at least $100, one per cent of such sales to go directly to employe securing prospect, one per cent into common fund to be divided equally among eligible employes. Two per cent of sales on which salesmen make original contact put into common fund to be divided at close of campaign among eligible employes. After sales in each district reach quota based on sales for same months previous year, two per cent of the amount over and above the quota placed in special district fund to be divided equally among eligible employes in the district. Total sales, $70,240.51.

*Water Heater Campaign:* (Oct. 15 to Oct. 31, 1938.) Salesmen to receive regular commission on water heaters, Prize Parade Premium Certificate, Special Company Award of $1. Employes receive two per cent of total amount of sales of water heaters, as follows: Employes of each district to be divided up into teams of three or four, all teams to be as evenly matched as possible based on previous experience. At close of campaign, two per cent of total amount of sales of water heaters for which each team is responsible divided equally among the members of that team. Total sales, $5772.14.

*Cash for Christmas Campaign:* (Nov. 21 to Dec. 20, 1938.) Five per cent of the appliance sales of each district up to amount of quota placed in common fund for the system. Ten per cent of amount of appliance sales of each district over and above quota placed in same fund. Fund divided equally among all regular employes at end of campaign. Total sales, $73,217.96.

*Fourth Annual Vacation Fund Campaign:* (April 5 to May 20, 1939.) Two per cent of total sales of ranges and water heaters to go to eligible employes. To be eligible, employe must be instrumental in securing gross sales of ranges and/or water heaters amounting to at least $50. One per cent of such sales will go directly to employe securing prospect; one per cent to go into common fund to be divided at the close of the campaign. Two per cent of the sales on which salesmen make original contact will be put into common fund, salesmen to participate with other eligible employes in the fund. Total sales, $49,864.39.

*Cash for Christmas Campaign:* (Nov. 10 to Dec. 15, 1939.) Five per cent of the quota placed in common fund for employes. Ten per cent of sales in excess of quota went into same fund, as well as $2 for each new service and reconnect. This fund was divided equally among 236 employes. Total sales, $151,271.55.

**TABLE NO. 3. COMPARATIVE SUMMARY OF DIRECTLY AND INDIRECTLY CONNECTED METERS**

**(1932-1938)**

| *Year* | *Total Meters* | *Annual Increase* | *Cumulative Increase* |
|---|---|---|---|
| 1932 | 19,211 | ..... | ..... |
| 1933 | 20,036 | 825 | 825 |
| 1934 | 22,328 | 2,292 | 3,117 |
| 1935 | 24,477 | 2,149 | 5,266 |
| 1936 | 27,738 | 3,261 | 8,527 |
| 1937 | 30,730 | 2,992 | 11,519 |
| 1938 | 33,669 | 2,939 | 14,458 |

The "60-day Heating Campaign," better known to the employes as the Red Tag Sale, led all others in volume of sales.

The "Cash for Christmas Campaigns" have produced the most earnings for the employes, all of whom are included in the awards. The percentage of award money per dollar of sale is considerably higher in this campaign, the company having selected this as a method to give each field employe a worth-while Christmas gift. The 1938 "Cash for Christmas Campaign" produced $5393.23 for the employes.

### All-Time Record

In the 1939 "Cash for Christmas Campaign" an all-time record was set with total sales amounting to $151,271.55, or 132.7% of the quota established. This produced a fund of $11,943.16 to be shared by the company's 236 employes.

Three campaigns, "The Annual Vacation Fund," "Fall Heating Campaign," and the "Cash for Christmas Campaign" have been so popular and so productive that they have been repeated annually during the five-year period.

With such an ample supply of facts as a basis, C. H. Zachry, vice president in charge of sales, feels that the needs of his company are adequately met by his present plan of merchandising.

The company exerts every effort, according to Mr. Zachry, to treat all dealers fairly and to work with them in every way it can. The dealers generally feel that the activities of the gas company in advertising, house-to-house canvassing and carrying on sales campaigns really create a market for the dealers which stimulates their business.

The company also feels that it has been brought into closer contact with its customers through the merchandising work, and this has had a favorable effect on public relations.

It likewise knows the sales work has broadened the employes, causing them to learn more about gas, its uses and its advantages.

# GAS Camera

At the Hutchinson Gas Club annual Christmas luncheon in New York, December 4, were (seated, left to right): Walter C. Beckjord, president, American Gas Association; J. R. Wohrley, Electric Advisers, Inc.; C. R. Bellamy, Columbia Gas & Electric Corp.; Ray Ranson, Panhandle Eastern Pipe Line Co.; E. J. Murphy, Brooklyn Union Gas Co.; L. O. Gordon, Federal Water Service Corp.; Elliott Taylor, G A S; Ross Holmes, New York Public Service Commission; R. Van Vliet, New York & Richmond Gas Co.; Fred B. Parke, Brooklyn Union Gas Co.; A. B. Huyck, Brooklyn Union Gas Co.; and S. P. Cobb, Ebasco Services, Inc. Standing: Floyd Parsons, Gas Age; F. L. Fairchild, Sprague Meter Co.; John D. Alden, Jersey Central Power & Light Co.; A. I. Phillips, American Gas Journal; Alan Lockwood, Penn Western Service Corp.; Harold L. Gaidry, New Orleans Public Service, Inc., and Oliver Hagerman, Atlantic Seaboard Corp. Photo by A. G. King, A.G.A. (See page 54.)

Salesmen of the McLaughlin Appliance Co., Mankato, Minn., examine an old "wood" stove which was turned in on a new Roper range during a Round-Up sale. Note the hatchet and knife stuck in the wood oven. The stove was originally used with bottled gas and later converted for natural gas.

AT RIGHT: W. C. Mainwaring, general sales manager of the British Columbia Electric Railway Co., Ltd., Vancouver, B. C., broke into a company CP range demonstration meeting last fall selling "ex tras" which outlined the merits of gas for cooking.

BELOW: These "thirty-niners in a bold dash for cold cash" were leaders in a recent sales contest conducted by Laclede Gas Light Co., St. Louis, Mo.

BELOW (at right): C. A. Miller, regional sales manager, A. L. Spring, district sales manager, Servel, Inc., and J. E. Kern, general supervisor of domestic sales, Southern California Gas Co., examine a new model of the Electrolux at recent Los Angeles showing of 1940 models.

# Selling Gas in Summer

## A Method of Estimating the Profit Possibilities Of the Gas Industry's Air Conditioning Market

• **SUMMER AIR CONDITIONING by gas has long been considered one of the industry's most promising sales fronts, one that would not only build but would also level out the yearly load. However, the benefits to accrue have been primarily speculative and not based on facts and figures. The present study by ALLEN W. LUNDSTRUM of Ebasco Services, Inc., which was presented under the title, "Market Possibilities and Equipment Available for Summer Air Conditioning by Gas," before the Annual Convention of the American Gas Association in New York on October 10, 1939, is of especial interest because the actual monetary gains are developed on a foundation of fact and on comprehensive study.—(Abstract by G A S).**

THERE is little background of experimental data in connection with summer air conditioning and, therefore, any estimates of what this load amounts to so far as the industry is concerned must be arrived at from a theoretical calculation of certain hypothetical cases. A number of approximations must of necessity be made if the final answer is to be simple enough to be of any use. The figures presented in this paper are not intended to be mathematically exact, but they are of the right order of magnitude and should help to present a better conception of the summer air conditioning load than many utility men now have.

Summer air conditioning is dependent upon the amount of space to be conditioned, the construction of the buildings involved, and the condition of the weather. It so happens that most gas utility men are rather familiar with the load possibilities of winter air conditioning, i. e., heating. Fortunately there is a general relationship between the magnitude of summer air conditioning load and winter air conditioning load. This is true because the factors of space to be conditioned and construction of buildings are common to both loads. Also, there is generally an inverse relationship between amount of heating necessary and amount of cooling necessary. It seems from these facts it is possible to relate summer air conditioning load. Inasmuch as most of us know the magnitude of our winter air conditioning load and the degree days deficiency of our territory, the relationship of summer air conditioning to winter air conditioning is a useful and reasonably accurate figure to guide us in our consideration of this important load.

Let us proceed to derive such a relationship. For this purpose we must first choose a building to be conditioned which is somewhat typical of the ones to be encountered. The test residence at the University of Illinois has been chosen. This was done primarily because it is a well-known and publicized residence which has been used for numerous air conditioning tests and as a result the heat losses and heat gains have already been computed to a reasonable degree of accuracy. This test residence, however, has about nine rooms and is, therefore, somewhat larger than the average dwelling unit. Heat losses and heat gains have, therefore, been reduced two-thirds to make the figures more nearly approach an average residence.

Since the relationship between summer and winter air conditioning will depend upon the weather conditions, it is necessary to assume that this average house be located in a number of different cities to establish general relationships. For this purpose the following cities were used:

| *Cities* | *Total 1938 Degree Days Deficiency* |
|---|---|
| New Orleans, La. | 1065 |
| Houston, Texas | 1142 |
| Mobile, Ala. | 1435 |
| Dallas, Texas | 2009 |
| Memphis, Tenn. | 2543 |
| Washington, D. C. | 4030 |
| Kansas City, Mo. | 4260 |

It is known from experience that winter air conditioning depends largely on the degree days deficiency below 65° F. It is known also that summer air conditioning depends on both the temperature and the humidity. Summer air conditioning, however, seems to be more readily figured from the maximum temperatures occurring during the day than from the mean temperatures. The U. S. Weather Bureau reports are the only sources of informa-

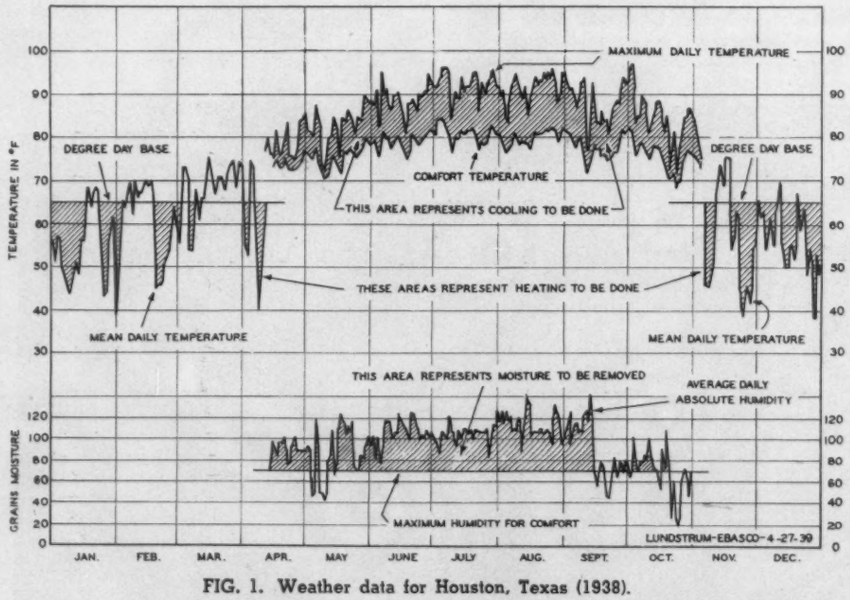

MAXIMUM DAILY TEMPERATURE
DEGREE DAY BASE
COMFORT TEMPERATURE
THIS AREA REPRESENTS COOLING TO BE DONE
DEGREE DAY BASE
THESE AREAS REPRESENT HEATING TO BE DONE
MEAN DAILY TEMPERATURE
MEAN DAILY TEMPERATURE
TEMPERATURE IN °F
THIS AREA REPRESENTS MOISTURE TO BE REMOVED
AVERAGE DAILY ABSOLUTE HUMIDITY
MAXIMUM HUMIDITY FOR COMFORT
GRAINS MOISTURE
LUNDSTRUM-EBASCO-4-27-39
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

FIG. 1. Weather data for Houston, Texas (1938).

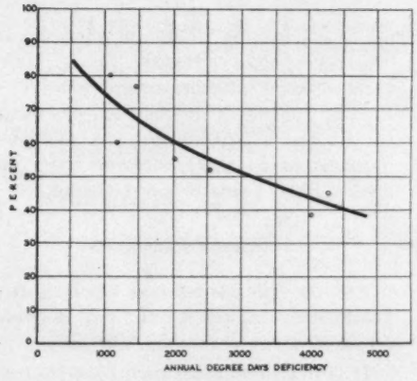



**FIG. 2. Peak day for summer air conditioning in per cent of peak day for winter air conditioning assuming all buildings completely conditioned.**

tion available on weather, and these reports generally give mean, maximum and minimum temperatures, as well as some indication of humidity.

An example of these Weather Bureau figures is shown in Fig. 1. On Fig. 1 are plotted the mean temperatures of each day for the heating season, the maximum temperature of each day for the possible cooling season, and the absolute humidity in grains of water per pound of dry air. The amount of heating in this city is represented by the shaded area below 65° F. on the mean temperature curve. Since comfortable conditions for summer air conditioning are generally considered to be obtained when the inside temperature is one-half of the difference between the outside temperature and 70° F., and when the absolute humidity is lower than 69 grains of water per pound of dry air, the summer air conditioning load is represented by something proportional to the sum of the areas between the maximum temperature line and the comfortable temperature line, and the area between the humidity curve and the 69 grain line.

### Derivation of Equations

In order to translate weather conditions into gas load, it is necessary for us to derive both heating and cooling equations for hypothetical residences in terms of the factors shown on Fig. 1. For winter air conditioning the relationship is very simple, being 42,600 B.t.u.'s of gas input per day per degree temperature deficiency under 65.

For summer air conditioning, however, the relationships are somewhat more complex. The hourly heat gain for our typical residence has already been calculated. The total heat gain is divided into three parts:

1. A constant amount, which is dependent only upon the occupancy of the space and the mechanical equipment which generates heat inside that space.

2. A heat gain roughly proportional to the difference between the temperature inside and outside.

3. A part which is dependent upon the amount of moisture to be removed from the air each hour.

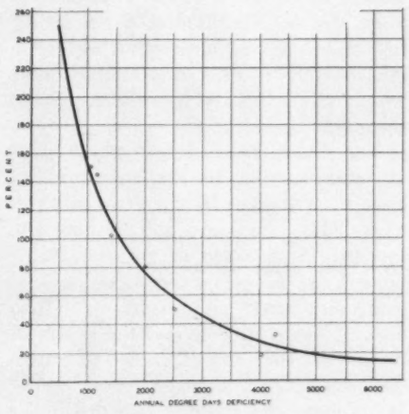



**FIG. 3. Annual gas sales for summer air conditioning in per cent of annual gas sales for winter air conditioning, assuming all buildings completely conditioned.**

The heat gain equation for our hypothetical residence is as follows:

Total heat gain in B.t.u./hr.=2400+ 1270 ($t_o$—$t_i$) +147 (Grains $H_2O$—69).

In order to translate this heat gain per hour into gas load per day, it is necessary to determine the number of B.t.u.'s of gas to remove a B.t.u. of heat by the cooling mechanism, and also to determine the number of hours per day which the conditioning system will operate. It has been assumed for these calculations that it will require 2.2 B.t.u. gas input in summer air conditioning system to remove 1 B.t.u. of heat gain. This is not based upon any particular type of gas air conditioning equipment, but might reasonably represent some medium value of all of the now available types. Therefore, the gas input is

B.t.u. gas input per hour=5300+ 2800 ($t_o$—$t_i$) +323 (Grains $H_2O$—69).

There is a definite relationship between the maximum temperature that occurs on any day and the number of hours that the air conditioning equipment must operate. This relationship was determined by taking a number of cities where hourly temperatures were available from Weather Bureau information and determining the effective hours of operation for the system at the maximum rate for the day. This relationship amounts to approximately .58 hours per day for each degree that the maximum temperature for the day is in excess of 74° F.

Having established the general heating and cooling relationships to weather for a typical house, we can apply these relationships to the weather conditions for each of the typical cities under consideration, figuring both the winter and summer air conditioning load each day for the year 1938. We are now in a position to show simple, tangible relationships.

In Fig. 2 is shown the relationship of the peak day of summer air conditioning to the peak day of winter air conditioning of the same space. It can be seen that the summer peak amounts

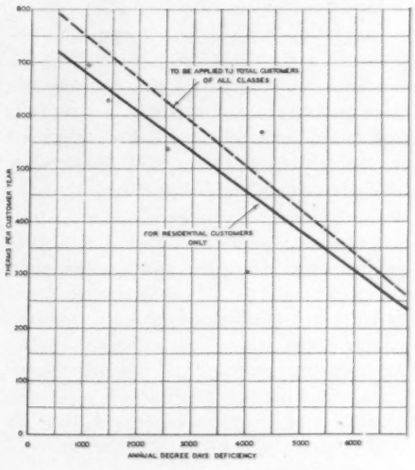



**FIG. 4. Average summer air conditioning load per customer year, assuming complete conditioning.**

to a maximum of 85% for a climate having 500 degree days of heating down to approximately 40% for a climate having 4500 degree days of heating. This relationship is important because it shows definitely no matter if we had 100% saturation of summer air conditioning there would never be a summer peak. In other words, no matter how much summer air conditioning we would sell, it would always be off peak and, therefore, any revenue obtained from this load in excess of bare incremental cost of gas will appear almost entirely as net revenue to the utility company. It is not meant by this statement that the rates to be used will be dictated by incremental cost levels. However, any rate which is ultimately decided upon, from competition or other factors, will yield what amounts to a profit over incremental cost.

Fig. 3 shows the relationship of

annual gas sales for summer air conditioning to annual sales for winter air conditioning of the same space. It can be seen from this curve that summer air conditioning amounts to approximately 250%, or two and one-half times the possible gas sales for heating. For 2000 degree days, the summer load amounts to 80% of the winter load. The relationship shown in Fig. 3 offers probably the simplest and easiest way for rough computation for summer air conditioning requirements. It should be remembered, however, that this curve is based upon the assumption that any given amount of space is completely conditioned both in summer and in winter.

### Determining Load

Fig. 4 gives another set of relationships from which the magnitude of possible air conditioning load may be readily determined. Two curves are shown—one to be applied to residential customers only, and the other to be applied to all classes of customers. The solid curve indicates that at 1000 degree days heating approximately 680 therms of gas might be sold per customer for summer air conditioning. In other words, the total possible residential air conditioning load may be roughly calculated by multiplying the number of residential customers on the system by the therms per customer shown on the curve corresponding to the annual degree days deficiency of the territory.

In commercial establishments the ratio summer to winter air conditioning load should be greater than for residential load. This is true because of the generally greater proportion of heat gain from occupants, lights, motors, etc. Therefore, it is conservative to assume the same ratio of summer to winter air conditioning load for commercial as residential. A relationship of commercial heating load to residential heating load of a typical company having a high heating saturation was determined. From these relationships the dashed curve on Fig. 4 was derived. The entire summer air conditioning load, including commercial and industrial, may be roughly computed by multiplying the total customers of all classes by the therms per customer shown on the dashed curve corresponding to the annual degree days for the territory.

In an effort to arrive at the order of magnitude of total possible summer air conditioning sales in the United States, a weighted average degree day deficiency was roughly calculated. For the natural gas industry this weighted average is approximately 4100 degree days per year. For the manufactured gas industry, the weighted average is 5700 degrees days per year. Applying the average therms per customer year for all classes of customers as given in Fig. 4, we find that there is a total potential summer air conditioning load of the natural gas industry of about 350,000,000,000 cu. ft., or approximately one-quarter of the present total sales. For the manufactured gas industry, there is also approximately 700,000,000,000 cu. ft. of potential load, which amounts to over 50% of present sales.

The load possibilities of summer air conditioning to the gas industry have been shown. It is a little difficult to translate load into dollars profit to the utilities because of many variable factors, such as incremental cost of gas, competitive conditions, etc. However, it seems not beyond the realm of possibility that manufactured gas utilities could obtain a net profit of 15c per M c.f. and the natural gas utilities a net profit of 30c per M c.f.

This would mean an increase in annual net revenue to manufactured gas utilities of $110,000,000, or a 60% increase over present net revenue.

For the natural gas utilities this would mean an annual net revenue increase of $110,000,000, or 50% increase over present net revenue.

### Revenue Possibilities

For the gas utilities as a whole the possible increased annual net revenue might be as much as $220,000,000.

It is not presumed that these figures will ever be reached, but they do represent the order of magnitude of summer air conditioning load possibilities. The amount of this summer air conditioning load, which we succeed in annexing for ourselves, would depend largely upon how energetically, enthusiastically, and effectively we go after it. A tremendous load is there waiting to be developed. It is up to the utilities in the gas industry to go out and get it, and in doing this it is necessary that the utilities give real cooperation to the equipment manufacturers in developing apparatus suitable for this load.

# Panhandle Eastern Plans $3,500,000 Loop Project

PANHANDLE EASTERN PIPE LINE CO., Kansas City, Mo., has announced an expansion program involving the expenditure of approximately $3,500,000, according to an announcement by J. S. Stevenson, chief engineer. The program consists principally of the installation of approximately 137 miles of 24 in. and 22 in. main line loops, there being nine loops in all. The program, when completed, will add between 25 and 30 million cu. ft. of natural gas per day to the company's delivery capacity, thus enabling it to meet the increasing demands of its customers already connected to its pipe line system, as well as to serve additional customers in its trade territory. The lines to be constructed will be located in the States of Kansas, Missouri and Illinois. In addition to the loop construction, the program includes the installation of an additional 1000 hp. compressor unit at the company's Glenarm Compressor Station located about 18 miles south of the City of Springfield, Ill., as well as certain additions to its existing gasoline extraction and dehydration plant near Liberal, Kan.

Contracts for the pipe required to carry out this construction have been awarded to the National Tube Co. of Pittsburgh, and the A. O. Smith Corp. of Milwaukee. Approximately 25,000 tons of steel will be required. Loop construction contracts have been awarded to T. R. Jones and I. C. Little, both of Dallas, Texas. Actual construction of the pipe lines will commence immediately, and it is expected that it will be completed by late winter or early spring. Barrett and Wailes Dove-Hermiston coatings are being used.

This pipe line construction project represents a continuation of the looping program which was commenced in 1937.

■ ■

## New Mid-Southeastern Gas Association Formed

The Mid-Southeastern Gas Association was organized at the annual Institute for Gas Plant Operators at the University of North Carolina, Raleigh, N. C., November 16-17. Officers elected are:

S. L. Duckett, gas engineer in charge of operation, Duke Power Co., Charlotte, N. C., president; J. R. Hobson, Jr., director of public relations, City of Richmond, Va., first vice president; Ralph Fry, division manager, Raleigh Gas Co., second vice president, and Edward Ruggles, N. C. State College, secretary and treasurer.

# Appliance Service Charge Increases Utility Income

• **HALL M. HENRY, assistant to the president, New England Gas & Electric Association, Cambridge, Mass., in a paper, "Increasing the Gas Operating Income," presented before the Annual Convention of the Empire State Gas & Electric Association, of Rye, N. Y., October 19, 1939.—(Abstract by GAS.)**

THE annual servicing cost of gas appliances has steadily increased and is of great concern to the entire industry. The New England Gas Association, realizing the importance of doing something to lower these costs, has taken official action by establishing this as a major problem for study. Our own companies, New England Gas and Electric Association after a careful study of the servicing problem, decided to charge for service. This was first applied to gas heating in New Bedford. The charge policy went into effect in September, 1938 at the time of filing new lower gas heating rates. The new rates represented a 15% to 20% reduction in heating costs to old customers.

### Insurance Contract

The charge policy consisted of setting up an annual insurance contract of $10.00 per central heating unit, this charge to cover all service calls plus the replacement of worn out or defective parts of the gas appliance and its controls; and a labor charge of $1.00 for first half hour and 50c per half hour thereafter for calls not covered by the insurance contract. The company decided to continue to clean burner, boilers and furnaces once per year and to light burner in fall, all other work to be charged for. The heating customers were told of the new charge policy at the time of presenting the new rates. The charge policy resulted in the following:

| | |
|---|---|
| Number of customers on new rate | 156 |
| Number of customers on new rate taking annual insurance contracts | 94 |
| Number of customers not taking annual agreement | 62 |
| Charge, service revenue, first year | $940.00 |
| Actual service cost | 658.00 |
| Difference | $282.00 |
| Cost of servicing house heating per job before charge policy | $16.00 |
| Cost of servicing house heating per job after new policy | 6.65 |

The sales results have not been affected by this change in policy.

Further study of servicing disclosed the fact that a free servicing policy did not mean that customers' appliances were in good operating condition but quite the reverse. It further showed:

1. A small 20% of our customers were getting 80% of the service.
2. Over 70% of the calls were to so-called unprofitable customers.
3. Ninety percent of calls on valves, cocks and burners on old worn out ranges and gas ends.
4. Free service did not eliminate large majority of appliances being in need of repair.
5. Average time spent per service call 12 to 15 minutes with many recalls due to necessity of giving only temporary repair because of large number of calls to be taken care of.
6. Dealers selling cheap appliances and expecting company to keep in operating conditions.

Hence, in the interest of better service, rather than economy, and in promoting sales of better appliances, the bold step of charging for *all* gas servicing was decided upon. About this time it was learned that the Long Island Lighting Co. had embarked on a charge service policy on certain appliances. Two delegations were sent to this company to study the methods used in putting their type of charge policy in effect, and the helpful suggestions made by the members of the Long Island Lighting Co. were of great importance in outlining our policy. On June 1 the service charge policy was officially launched in Cambridge and Somerville, Mass. Briefly, our policy is as follows:

1. We give the following warranties:

| | |
|---|---|
| Ranges | One (1) Year |
| Water heaters | One (1) Year |
| Heating appliances | Three (3) Years |
| Refrigerators | Five (5) Years |

2. Offer following Annual Insurance Agreements:

| | |
|---|---|
| Ranges | $2.00 (no enameled parts) |
| Water heaters | $3, Instantaneous $5 |
| Refrigerators | $2.00 |
| Kitchen heating | $3.00 |
| House heating | $10.00 |
| House heating, range plus automatic water heater | $13.00 |
| House heating, range plus instantaneous water heater | $15.00 |

3. Charge for service not covered by contracts or warranty at following rates:

| | |
|---|---|
| First half hour | $1.00 |
| Additional half hour | .50 |
| Minimum | 1.00 |

10% Discount for Cash.

The results to date of charge service policy are as follows:

| | |
|---|---|
| Total calls (June through September, 1938) | 10,423 |
| Total calls (June through September, 1939) | 8,007 |
| Calls free (June through September, 1938) | 10,423 |
| Calls free (June through September, 1939) | 6,105 |
| Saving in free calls | 41% |
| Saving in total calls | 23% |

Revenue first four months, $3,414, or at average $1.79 per charge call. About 60% of the amount collected was paid in cash at completion of work.

Among the free calls are all calls during warranties; heating calls not charged for (cleaning burners and lighting in fall); and policy calls. The free calls will undoubtedly increase during next few years as we continue to sell more and more appliances because of warranties. Yet it is felt that a real step toward reducing the unwarranted calls and in improving the quality of the service has been made.

It is interesting to note that but one letter of complaint was received at announcement of policy, although lately there have been a few written complaints, possibly 10, and also a number of verbal complaints—one from a member of the Board of Directors. One complaint was sent to the Commission, which took the position that it had no jurisdiction as this was an appliance service as distinguished from gas service.

### Combination Company

In Cambridge the electric company is affiliated with the gas company, whereas in Somerville there is competition with the Boston Edison Co. Thus the policy is being used in what might be termed a combination company and in a straight gas company.

It is estimated that the charge policy, which thus far is complete in all of our companies on house heating and refrigeration, and on all gas appliances among one-third of our customers, will save immediately $25,000 per year. If and when it is placed in effect in all companies the saving will be $60,000 per year on present appliances in use and the savings will naturally increase as we put out more appliances. This saving amounts to 50c per total customers.

# IRRIGATING THE NEW MEXICO DESERT WITH NATURAL GAS

By H. N. OLDHAM Manager, Pecos Valley District, New Mexico Eastern Gas Company

DURING its early history, arid Southeastern New Mexico was first settled and developed strictly as a cattle country. This semi-desert section could not be further developed without irrigation, and water for this purpose became the major objective of those seeking to establish homes.

H. N. OLDHAM

Some 40 years ago, in the valley of the Pecos River, artesian water was discovered and used extensively for irrigation. By the simple process of drilling a well, man tapped this underground water source, which under its own pressure would flow to the surface, literally converting the desert into a garden spot. Artesia, New Mexico, derives its name from this artesian water, which was also found in the vicinity of Roswell. As the years passed one could soon drive between Artesia and Roswell through green fields and prosperous farms where formerly only cactus, mesquite and scattered scrub desert grass was known to grow. Thriving centers of farm life sprang up, orchards were planted, homes were built, and year after year more and more wells were drilled and more land put into cultivation. Over a period of years, however, so many wells were drilled that artesian water pressure began to diminish, until certain wells finally ceased to flow. Gradually section after section of land had to be abandoned because of lack of artesian water, and these sections reverted to their original arid, desert-like state.

### Line Built

In 1929, while the pressure of artesian water in some areas was continuing to decline, the Pecos Valley Gas Co., now the New Mexico Eastern Gas Co., subsidiary of the Southern Union Gas Co. system, laid a 41-mile, 8-inch line from the gas fields 12 miles east of Artesia to Roswell. Roswell previously had been served with manufactured gas. In general, the north 20 miles of this gas line paralleled the Pecos River, the land east, or between the gas line and the river, being low enough for artesian water to flow while the higher land to the west was that curtailed by diminished flow of artesian water.

About this time certain farmers were finding that particular artesian wells would flow during the winter months, but during the irrigation season the water flow was so small that large scale farming was impossibble. To obtain additional water during the summer, some of these farmers installed pumping plants, but complained that the cost of pump operation was excessive with costs rising each year as the water level lowered.

Many farmers, in an attempt to economize on the cost of other sources of power, began to install automobile engines taken from old or wrecked cars. Several of these engines put into operation adjacent to the gas company's main line were converted to use natural gas for fuel, and the farmers found that their fuel bills were lowered almost an unbelievable degree, actually making an otherwise unprofitable farm profitable.

For example, one account is operating a 95 hp. Waukesha gas engine. This plant lifts water 115 feet with a 16-inch Johnston pump at a rate of some 15,000 gals. per minute. During the past season this plant has irrigated a total of 115 acres of cotton, 55 acres of small grain, and 110 acres of alfalfa. His total gas bill for the season was $777.58, which was consumed during the eight months when the gas for heating was not required.

In this area the average rainfall is 14 in.; however, in 1938 the rainfall was 9½ in., and during 1939 it was 11 3/10 in. The water conservation program is set up to allow a person to pump 36 in. of water per acre from a shallow well, and an artesian well is allowed to flow a like amount. Twenty-four inches of water are considered sufficient for all needs during an average growing season.

The company, desiring to cooperate with this new farming activity, set a sound, reasonable gas engine rate, beginning at 40c for the first 100,000 cu. ft. and scaling down. Soon the success and economy of pumping with natural gas engines was definitely established, and in 1932 the first major rural gas extension was run into the territory known as East Grand Plains. Much of the credit for obtaining this unusual gas load and for maintaining favorable customers' relations must be passed on to Lawrence Carrell, manager of this pumping district.

Up to this time standard centrifugal pumps had been used, which necessarily were located on top of the ground or in an expensive and unhandy pump pit. However, a new style centrifugal turbine pump appeared on the market and soon became popular. This new pump, designed to fit into the drilled well resting at water level, made it possible to pump conveniently from almost any depth.

### "Shallow Water" Pumping

In much of the area formerly farmed old non-flowing artesian wells had been plugged. New wells to this artesian water could not be drilled, as a very successful water conservation program had been put into effect. In this section and in other areas never before farmed, an abundance of non-artesian "shallow water" was found at depths ranging from 50 to 150 ft. Because of the low initial cost and low cost of operation of natural gas engines, this source of power was applied to "shallow water" pumping. This source of cheap power made it possible to redevelop areas heretofore completely abandoned and soon even areas never before under cultivation were converted into flourishing farms.

In the running of main line extensions to develop and re-develop this territory, domestic gas consumers were, of course, obtained. Up to the present date, the Pecos Valley District of New Mexico Eastern Gas Co. has laid and is operating over 60 miles of these high pressure main line extensions,

serving at the present 150 pumping plants. Gradually as this work progressed, old automobile engines were replaced with better equipment. However, two Dodge, two Chevrolet and nine Buick engines are still giving satisfactory service. Due to the low initial cost, a number of new automobile engines equipped for stationary service were purchased, 21 Model B Ford engines, 46 V-8 Ford engines now being operated along with two Lincoln Zephyrs. Stationary engines of better quality are becoming more and more popular. There are at the present time in operation one LeRoi, one Holt, one Bessemer, five Twin Cities, nine Internationals, two Stovers, seven Hercules, seventeen Allis Chalmers and twenty-five Waukesha engines. The total combined horsepower of motors used for pumping plants is approximately 9500.

### Engine Equipment

The majority of the engines are equipped with valve oilers and natural gas carburetors, many being equipped with oil baths on both the air and gas supply, as well as oil filters. Others are entirely automatic with cut-offs for low oil pressure, over-heating, belt breakage or slippage, etc. In the initial stages of development, as a cooling system, a small portion of the water pumped from the well was passed directly through the engine. Due to hard water, liming effect was experienced in the water jackets and this system of cooling was abandoned. A closed water system is now used, cooling effect being obtained from water coils located in such a way as to be cooled by the water being pumped from the well.

Seventy-eight of these pumping plants pump from artesian wells; 68 pump from "surface" or "shallow wells"; the remaining four pump from the river. The average lift of artesian water is 20 ft., and the average lift of "shallow" or "surface" water is 75 ft.; maximum lift is 130 ft.

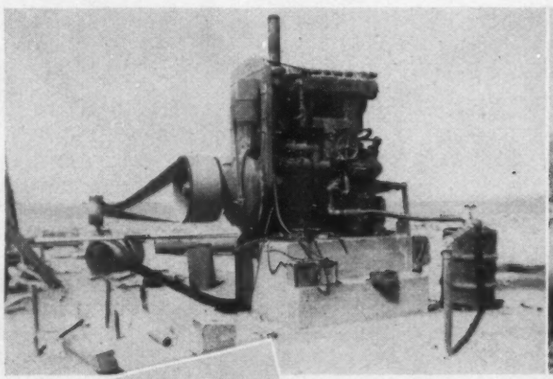
The cost of natural gas fuel necessary to irrigate an acre for a year of course varies widely with the type of equipment used and the height of "lift" to which the water must be pumped. For an average plant lifting water 75 ft. the approximate cost of fuel per acre per year is $4.00 for alfalfa and $2.00 for cotton or small grain. Pumping from non-flowing artesian wells with an average lift of 20 ft., the cost is often reduced to as low as $2.00 per acre per year for alfalfa and $1.00 for cotton and small grain.

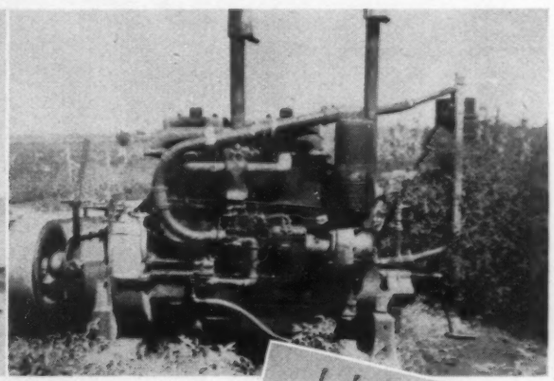
The total acreage under cultivation where natural gas power is the basic source for irrigation water is 17,730 acres. Approximately 40% of this acreage is in cotton, 40% is in alfalfa, and the remaining 20% is in small grain and miscellaneous crops.

At the present time gas supplied for pumping purposes is running well over 120,000 M c.f. per year. The value of such a load and source of revenue is amplified by the fact that 85% of this pumping occurs during the off-peak summer months of April through October, over 100,000 M c.f. of this 120,000 M c.f. being consumed for this period.

### Other Applications

The economy in using natural gas engines in the pumping field has brought about the application of gas power to other lines of activity. In the last three years 1250 hp. of gas-driven cotton gin engines have been obtained in this district in addition to many other miscellaneous gas engine loads. Recently, in Carlsbad, New Mexico, a 2000-hp. natural gas engine was installed at the power plant, bringing the total hp. of natural gas engines to approximately 14,000 in a district having 2782 directly connected meters.

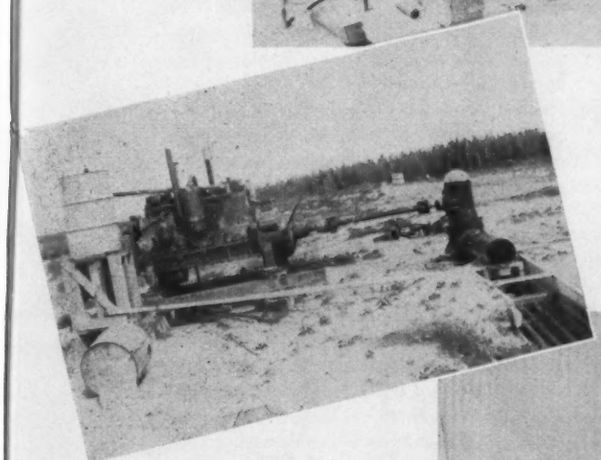


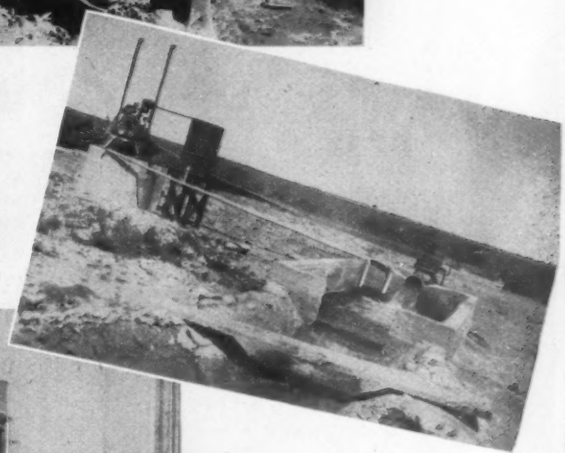


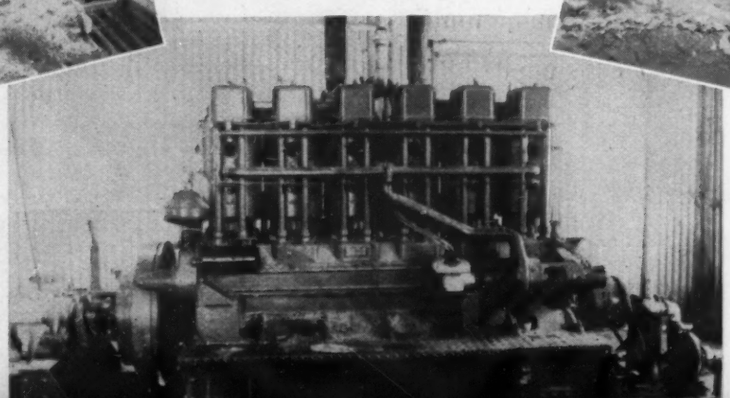
**ABOVE (at left): A 165-hp. pumping plant. Gas consumption for the first 30 days of operation was 748 M c.f.**

**ABOVE (at right): A 65-hp. plant in the field ready for service.**

**BELOW: A 165-hp. natural gas engine used in a cotton gin. Power costs per bale of cotton ginned were reduced from over 70 cents to less than 10 cents.**







**A 125-hp. direct connected pumping plant. The cooling coils are shown directly below the discharge of the pump.**

**A V-8 automobile engine equipped for stationary natural gas service. Note the cotton field in the background.**

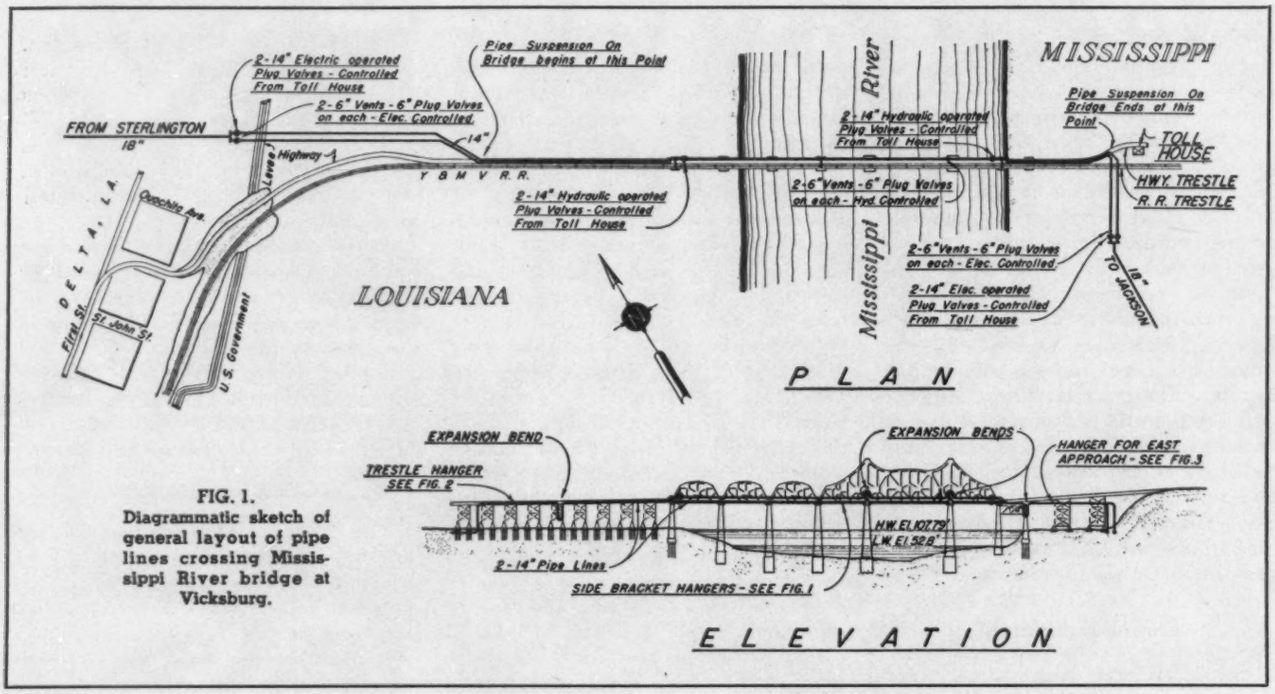

2-14" Electric operated Plug Valves - Controlled From Toll House
Pipe Suspension On Bridge begins at this Point
2-6" Vents - 6" Plug Valves on each - Elec. Controlled.
FROM STERLINGTON 18"
14"
Highway 1
Levee
Y & M V R.R.
2-14" Hydraulic operated Plug Valves - Controlled From Toll House
DELTA, LA.
Ouachita Ave.
First St.
St. John St.
U.S. Government
LOUISIANA
Mississippi River
MISSISSIPPI
Pipe Suspension On Bridge Ends at this Point
2-14" Hydraulic operated Plug Valves - Controlled From Toll House
TOLL HOUSE
HWY. TRESTLE
R.R. TRESTLE
2-6" Vents - 6" Plug Valves on each - Hyd. Controlled
2-6" Vents - 6" Plug Valves on each - Elec. Controlled
2-14" Elec. operated Plug Valves - Controlled From Toll House
TO JACKSON 18"
PLAN
EXPANSION BEND
TRESTLE HANGER SEE FIG. 2
EXPANSION BENDS
HANGER FOR EAST APPROACH - SEE FIG. 3
H.W. EL. 107.7'
L.W. EL. 52.8'
2-14" Pipe Lines
SIDE BRACKET HANGERS - SEE FIG. 1
ELEVATION

**FIG. 1.**
**Diagrammatic sketch of general layout of pipe lines crossing Mississippi River bridge at Vicksburg.**

## UNITED GAS PIPE LINE COMPANY'S

# *Mississippi River Crossing*

**By D. E. STEARNS***

UNITED GAS PIPE LINE CO.'s Mississippi river crossing for the Monroe-Jackson pipe line is a new departure in the company's construction of large river crossings.

Topographic conditions between Monrose, La., and Jackson, Miss., indicated that the pipe should cross the Mississippi river at Vicksburg.

A contract was negotiated on September 29, 1939, between the company and the Vicksburg Bridge Co., which owns and operates the bridge. Design work was immediately commenced through the cooperative efforts of our engineers and those of the firm of Ash-Howard-Needles and Tammen of Kansas City, Mo., consulting engineers for the Vicksburg Bridge Co.

Approaching the Mississippi river from the Louisiana side over U. S. Highway 80, the road follows an upgrade on earth embankment, crosses the levee and immediately goes on a 1000 ft. stretch of wooden trestle curving to the right towards the river (Fig. 1 and 2). At the end of the wooden trestle work, the road straightens out and follows steel trestle work for a distance of about 4000 ft. At that point, it enters the west portal of the bridge at water's edge and continues for a distance of 3000 ft. to the water's edge at the east end of the bridge proper. Upon leaving the bridge, the highway again goes on steel trestle work and continues on to the high bank and into Vicksburg, passing the toll house about 400 ft. from the east end of the bridge.

The 18 in. pipe line approaches the river from the west in a direction parallel to the steel trestlework and bridge proper. Just before reaching the levee, the 18 in. line ties into an 18 in. header from which two 14 in. lines extend, passing over the top of the levee and thence underground alongside the steel trestle and 15 ft. apart, to a point within 700 ft. of the west portal of the bridge.

At this location, each 14 in. line rises vertically for a distance of about 50 ft. to the bottom member of the highway girders.

From this point the 14 in. lines extend side by side, supported on the bottom member on metal rollers, a distance of 700 ft. to the west portal of the bridge proper. Fig. 3 illustrates the manner of support for this section. In this section and in each line is a vertical hairpin-shaped expansion joint designed to allow movements due to temperature changes.

At the west portal of the bridge proper the two 14 in. lines swing out from underneath the steel trestle and follow the north side of the steel bridge proper. The lines are supported, one directly over the other, on rollers set in steel brackets which are welded onto the bridge steel work (Fig. 4). At two locations on the bridge, huge expansion bends in each line have been installed to allow for longitudinal movements of the pipe which will result from temperature changes.

At the east end of the bridge, the two lines swing back underneath the steel trestle work and are supported over this short section by rollers on the lower member of the highway girders. This section contains another set of hairpin expansion joints.

A third type of pipe support (Fig.

*Excerpts from an article printed in the *United Gas Log*, United Gas Pipe Line Co., Houston, Texas.

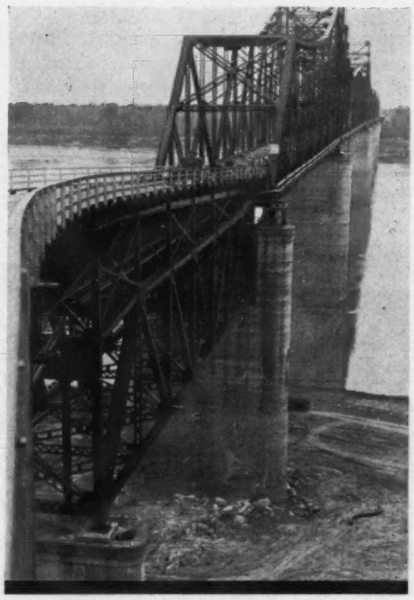


FIG. 2. United Gas Pipe Line's Mississippi River crossing showing pipe alongside and under bridge.

Using one of the 14 in. lines as an illustration, and considering points between the limits of the west and east headers, at each header a 14 in. valve is installed in the line with a 6 in. blowoff adjacent to it on the river side. All four of these valves are operated by reversible motors and connected to relays installed in small steel buildings located at each header. These motors are connected to a control cabinet located in the toll house at the east end of the bridge. In the event of an emergency, the attendant at the toll house can break a glass panel and push a button which actuates the interlocked controls. This causes the motors on the four valves described to start, and to continue running until the two 14 in. valves have closed and the two 6 in. blowoff valves have opened. Limit switches cut off the motors when the desired position of the valve has been reached.

The bridge attendant at the toll house is unable then to operate the two 14 in. Merco-Nordstrom valves with one 6 in. blowoff have been installed on the bridge proper. One 14 in. valve is near each portal, with a 6 in. blowoff valve in the middle of the bridge. These valves are controlled in a similar manner to the electrically controlled valves except that fluid lines transmit pressure to control cylinders located at the valves, which make possible their rapid operation by simply pressing an actuating mechanism in the toll house.

The successful solution of this river crossing problem is another example of the resourcefulness necessary to make available to the consumer the best in natural gas pipe line facilities.

The terrain through which the Monroe-Jackson pipe line crosses from the Mississippi river east is extremely rugged and is unusual from a standpoint of geologic formation.

This particular section of the country has a surfaced formation known as "Loess" which is a fine, sandy loam

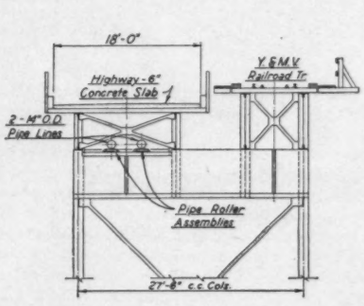



FIG. 3. Trestle hanger.

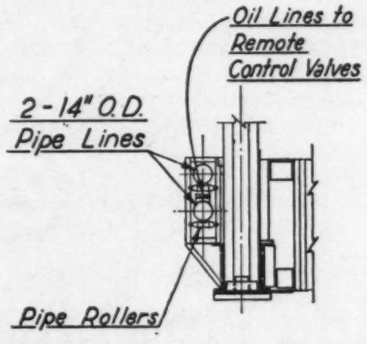



FIG. 4. Side bracket over main channel.

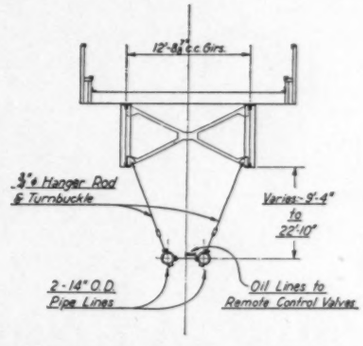



FIG. 5. Hanger for east approach.

5) is used over a short section of line under the east approach of the highway trestle just before the two 14 in. lines drop vertically for a distance of approximately 40 ft. and terminate this "multiple crossing" by extending underground from this point for a distance of 300 ft. to the east 18 in. header.

The underground portions of the two 14 in. lines are coated with coal tar enamel. All underground construction of the 14 in. lines between the levee on the west side of the river and the header on the east side of the river incorporates the use of river weights and anchors, to safeguard the operation of the lines in periods of high water.

For finger tip valve control, a dual installation of Merco-Nordstrom plug valves has been made. One is electrically controlled, the other hydraulically controlled.

valves further. However, the control cabinet contains another compartment which is locked. Only certain employes of our company will carry keys to this inner cabinet. In it are other buttons which will cause the motors to reverse, opening the two main 14 in. valves and closing the two 6 in. blowoff valves. Located in the small control houses at each header and available to employes of our company only, are other switches which can be independently used to open and close the valves.

Arrangements have also been made for telephone communication between the header control buildings and the toll house.

The equipment and manner of operation is exactly the same for both 14 in. lines and each line can be controlled independently.

As an added safeguard for control of the two 14 in. lines across the Mississippi river, an additional set of

FIG. 6. Sand bags placed in trench to protect backfill.

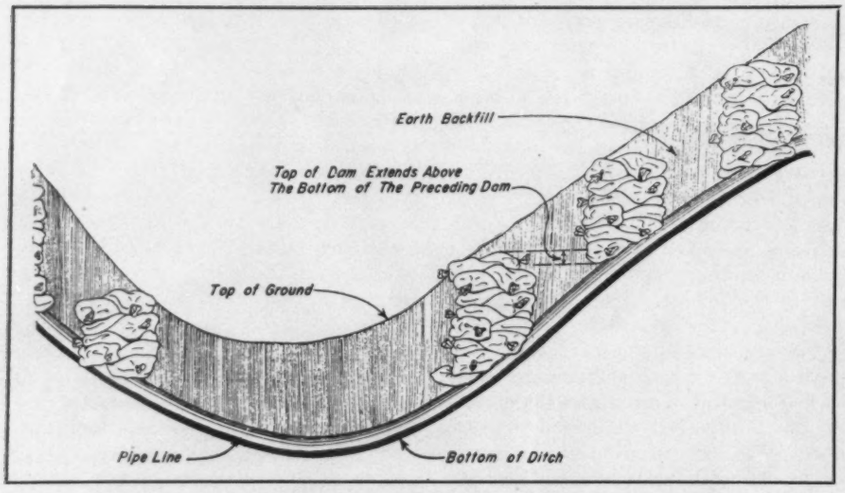



**FIG. 7. Sketch showing use of sand bags to protect pipe line ditch.**

originally deposited by the wind. This formation has been deeply eroded until ridges with very abrupt slopes have been formed, across which the pipe line cuts at almost right angles.

Since this formation is so susceptible to erosion, it was necessary to protect the backfill with sand bags on abrupt slopes. The accompanying picture (Fig. 6) and sketch (Fig. 7) show the manner in which these sand bags were placed. At all breaks on the slope, where wash or erosion was likely to occur, a dam was built across the ditch from the pipe line to the surface of the ground with sacks filled with earth. On longer slopes, several series of such dams were required. In addition, the pipe line between the dams was protected against erosion in the bottom of the ditch by a double row of earth-filled sacks.

On this section of line a total of 35,200 earth-filled sacks were used to protect the pipe line, of which approximately 3000 sacks were to protect the approaches to the Big Black river crossing alone.

This is another example of the care that is taken in the installation of new transmission lines to insure our customers continuous and dependable service with an adequate supply of natural gas.

# Louisiana-Nevada Pipe Line Approved By Commissions

WITH permission granted by the Federal Power Commission and the Utility Commissions of the states of Arkansas and Louisiana, the Louisiana Neveda Transit Co., a Neveda corporation, formed by T. R. Jones, pipe line contractor of Dallas, W. A. Delaney, Jr., oil producer of Ada, Okla., and M. O. Matthews, cement manufacturer of Ada, Okla., commenced construction on December 18 of a gas line from the Cotton Valley Field of Webster Parish, La., to the Okay and Hope, Ark., territory.

On completion of this 8-in. high pressure pipe line, expected about February 1, 1940, 20 million cu. ft. per day of high heat value natural gas will be made available to Western Arkansas. Source of gas supply for the system will be the gas reserve recently developed in the Cotton Valley Field of Webster Parish, La. Gas supply for the line will be furnished by the Oliphant Oil Corp., owners and operators of developed acreage in the high pressure gas producing area of the Cotton Valley Field.

Pipe for the system, including gathering lines, main line, lateral branches and distributing lines totaling more than 100 miles of Republic Grade B Electric Welded Seam pipe, was purchased from Bovaird Supply Co. of Tulsa, Okla. This supplier will also furnish a major part of the fittings to be used on the system including Merco Nordstrom valves, Metric orifice meters, Pittsburgh Equitable regulators, Peerless Line separators and Tube Turn welding fittings. The system is being built solid welded.

The gathering lines and main line of the system are designed for a continuance pressure of 800 lbs. per sq. in. The pressure-weight principal was applied in selection of pipe weights in the several sizes of pipe included in the system, providing a safety factor of four at the maximum working pressure of the line compared to the minimum bursting pressure of the pipe used.

The pipe line will be built and equipped for operation by the pipe line construction organization of T. R. Jones, Inc., Dallas, Texas; subcontract for the pipe stringing was let by this general contractor to C. Hobson Dunn of Dallas, Texas; subcontract for clearing of the right-of-way was let to Dixon and Horton of Kilgore, Texas.

The pipe is being transported by barge to Filston, La., and Camden, Ark. The pipe from Filston is being shipped by rail via Louisiana and Arkansas Railway Co. The line parallels the railroad system for approximately 50 miles.

■ ■

## Eugene Metz, American Meter Co. Manager, Passes

EUGENE METZ, 71 years old, resident manager in Kansas City the last 35 years for the American Meter Co., died Nov. 28. He was born in Erie, Pa., March 31, 1868.

In 1891 Mr. Metz began his long association with American Meter Co. By 1906, he had risen from timekeeper to stockkeeper, and from stockkeeper to purchasing agent of the Metric Metal Works at Erie, and was on his way to represent American Meter Co. at Independence, Kan., where an office and warehouse were maintained. Later, he was transferred to Wichita, and subsequently assumed charge of the company's Kansas City office and warehouse.

As Mid-Continent representative for his company, "Gene" Metz's sales territory latterly included Missouri, Kansas, Iowa and Nebraska.

Mr. Metz was one of the first members of the Natural Gas Association of America and one of the oldest members of the American Gas Association. He was a member of the Southwestern Utilities Association and the Middle West Gas Association.

■ ■

## Cherokee, Iowa, Changes Over to Natural Gas

Natural gas is now being served to Cherokee, Iowa, instead of the manufactured gas of past years. Service began early in December. From Cherokee the construction gang moved into Spirit Lake, Iowa, to perform a similar job there.

According to H. E. Bennett, manager of the Northwestern Light & Power Co., the operating company, it may be spring before change-overs can be made in Storm Lake on account of the difficulty of ditch digging during the winter months.

■ ■

## Active Gas Leader Dies

Carl Behn, 43, vice president of American Bosch Corp., Springfield, Mass., died Nov. 15, following a short illness. Mr. Behn had been with the organization since 1923, and had served as vice president of the Society of Automotive Engineers in 1938.

# Improving Gas Usage With Coffee Urns, Steam Tables

• **LAWRENCE R. FOOTE of the Central Illinois Electric and Gas Co., Rockford, Ill., is chairman of the Commercial Cooking Committee of the Industrial Gas Section, American Gas Association. This committee recently published Interim Bulletin No. 2-CC, "Improved Gas Applications to Coffee Urns and Steam Tables," and portions of this bulletin are herewith published.—(Abstract by G A S.)**

THE most common gas commercial cooking appliances in use throughout the country are probably the coffee urn and the steam table. These represent a substantial load to gas utilities and, as well, a considerable fuel item in the aggregate to commercial cooking customers.

With the increase in competition in this field, it has become apparent that the gas industry may suffer a loss of some of this load to improved types of competitive appliances. To avoid this condition, it is desirable that the industry inquire into methods that may improve the efficiency of these applications, so that a reduced fuel consumption will render them more acceptable to customers, and remove the threat of competition from this load.

The information presented herewith was a result of a series of tests made on these appliances to determine what increases in efficiency are possible through relatively slight changes in the appliance design. It was found that substantial fuel savings, from 24% to 42%, can be effected by making relatively slight changes in the design and without impairing in any way the operating results obtained from the appliances.

## Coffee Urns

The conventional coffee urn consists of a water tank, which contains the pottery coffee container, and which is heated by an urn burner placed underneath.

With a few exceptions, the principal heating surface is the bottom of the water container and no attempt is made to offset side radiation through the use of flue gases, or to obtain additional heating surface in this manner.

In order to determine possible fuel savings as a result of a better engineering approach to this heating problem, a standard 4-gal. urn was used and a steel jacket placed around the urn, with a ¼-in. annular clearance between the shell of the water container and the jacket provided as a flue passage.

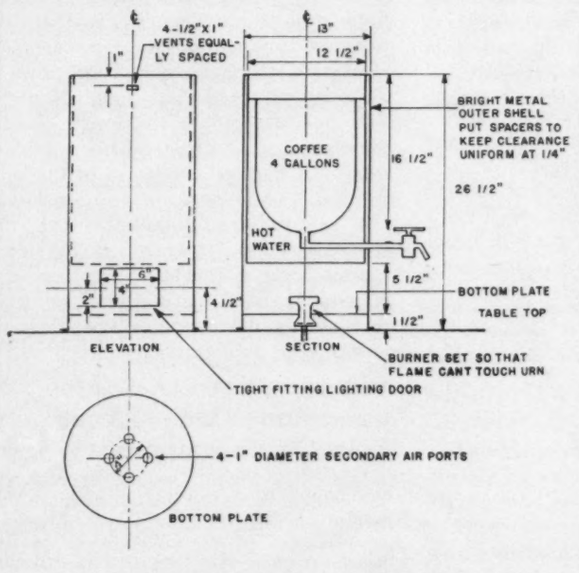



**FIG. 1. Improved coffee urn design.**

**BURNER AND VENT REQUIREMENTS**

| *Urn Size Gals.* | *Burner Size B.t.u. per Hr.* | *Vent Area Sq. Ins.* | *Secondary Air Ports* |
|---|---|---|---|
| 2 | 10,600 | 2.0 | 4-1″ dia. |
| 3 | 13,300 | 2.5 | 4-1″ " |
| 4 | 13,300 | 2.5 | 4-1″ " |
| 5 | 13,300 | 2.5 | 4-1″ " |
| 6 | 13,300 | 2.5 | 4-1″ " |
| 8 | 19,100 | 3.6 | 5-1″ " |
| 10 | 19,100 | 3.6 | 5-1″ " |
| 12 | 26,500 | 5.0 | 6-1″ " |
| 16 | 29,100 | 5.5 | 6-1″ " |
| 20 | 31,800 | 6.0 | 8-1″ " |

Four ½-in. by 1-in. vents were equally spaced around the jacket 1 in. from the top, to serve as vents, and the bottom of the jacket was tightly closed to control secondary air. Four 1-in. diameter secondary air ports were provided immediately beneath the burner and one 1-in. diameter peep hole was located in the side of the bottom enclosure. In addition, a lighting door was provided that could be reasonably tightly closed. A 13,300-B.t.u.-per-hour burner was located approximately 4 in. beneath the bottom of the water container and a temperature control was connected and set for 190° F.

Tests were run on the urn in its original condition and with the changes as indicated above, which indicated that a saving of 22.8% was made in gas required to heat the water container to 190° F., with 14 quarts of water in the coffee container, and a saving of 42% in holding consumption, maintaining a temperature of 190° F. The holding covered a period of six hours, which was sufficient to obtain average results. This substantial saving, particularly in the holding rate, indicates the possibilities of increased efficiencies that lie in the standard coffee urn. The recognition of such possibilities should permit utilities to approach their customers with the suggestion of fuel savings on this appliance, that should effectively protect them from competition, except insofar as the trend may be to use glass type coffee makers in place of the more conventional urns.

Since changes to urns in the field may not be fully justified on the basis of fuel savings, it would seem that the most effective procedure would be to induce kitchen equipment manufacturers to adopt more efficient designs, with the utilities demonstrating to commercial customers the saving that can be effected through the adoption of such designs. Fig. 1 indicates the modification in urn design and suggests burner and venting requirements for urns of different sizes.

## Steam Tables

While in recent years a number of new designs for steam tables have come on the market, none as yet have extensively replaced the conventional type of wet steam tables, which is still used in the majority of eating establishments for keeping foods warm.

Some development work has been undertaken in the direction of immersion heated gas-fired wet steam tables but no general acceptance of this ap-

plication has been received. The effort towards immersion heating was made primarily to save fuel and, as this bulletin indicates, almost the same result can be obtained with a minor change in the existing steam tables, without modifying the method of firing.

The conventional table consists of a metal container approximately 10 in. deep and of varying sizes, with urn-type gas burners applied beneath the pan with a burner spacing of approximately 2 ft.

Under this condition of fuel application, the principal heat absorbing surface is the bottom of the pan and no attempt is made to utilize the sides for heat absorption, nor is any attempt made to prevent over-ventilation or excessive side radiation.

To determine the effect of relatively minor changes in steam table design, a conventional steam table, measuring 49½ in. by 32¼ in. by 10 in. deep, was tested with thermostatic control at a temperature of 190° F. Another test was made with a side-skirting provided, for the reduction of side radiation and over-ventilation, and for the conduction of the products of combustion along the sides to the top of the steam table.

A skirting, consisting of ¾ in. of air-cell asbestos inclosed in sheet metal, was installed along four sides of the steam table, with a 1-in. space between the steam table side and the insulated jacket for the passage of flue gases. This skirting was extended 4 in. beneath the bottom of the steam table and suitable vent holes were provided at the top of the skirting, for carrying off flue gases.

This relatively simple installation effected a saving of 24.7% in holding consumption over the conventional design without insulation.

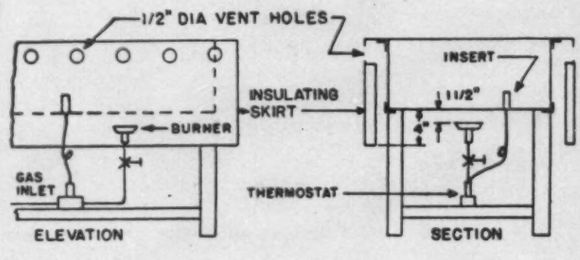



FIG. 2.

**Insulation recommendations in design of gas-heated steam tables.**

This fuel saving compares favorably with a saving of 27.5% over the original installation, which was obtained through the use of an immersion type gas application, along with the use of the side and end insulation. In view of the simpler application of the insulation alone, and approximate equality of the savings effected, it was believed that the insulation application was the more desirable of the two.

Fig. 2 illustrates this application and size of burners and vent hole areas for various size steam tables.

This discussion is not intended to serve as a brief for the wet steam table but does serve to illustrate the savings in fuel consumption that can be made by a relatively simple conserving application that should pay for itself on existing steam tables within a reasonable period of time.

### Conclusion

The substantial savings in fuel consumption effected by rather obvious and simple methods of fuel conservation may well serve to illustrate the point that many of our appliances in the field of food preparation, as well as in other commercial establishments, are relatively inefficient. Since inefficient applications are invitations to competitive attacks, and since practically no commercial gas application is without a competitive fuel or service, the industry should set itself to the task of putting its house in order, so far as efficient appliances and satisfactory fuel applications are concerned in the commercial field.

Our principal competitor in this field has already made considerable progress in smaller appliances, particularly of the counter type, and it may be expected that such progress will be extended to the larger appliances, including urns and steam tables, with still further extension to the major heavy duty cooking appliances. If the gas industry does not take the necessary step to place on the market, modern, well-styled, practical and efficient appliances, that will satisfactorily meet the needs of this class of customers, competitive industry will.

**NO. BURNERS, C.F. GAS PER BURNER, NO. OF VENT HOLES — USE NEAREST DIMENSIONS**

| *Width Inches* | *Length—Inches* 24 | 48 | 72 | 96 | 120 | 144 | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | No. of Burners |
| 12 | 3″ | 3″ | 3″ | 3″ | 3″ | 3″ | Burner size Dia. |
| | 5 | 10 | 15 | 20 | 25 | 30 | No. ½″ Vent Holes |
| | 1 | 2 | 3 | 4 | 5 | 6 | No. of Burners |
| 18 | 4″ | 4″ | 4″ | 4″ | 3″ | 3″ | Burner size Dia. |
| | 7 | 14 | 21 | 28 | 30 | 30 | No. ½″ Vent Holes |
| | 1 | 2 | 3 | 4 | 5 | 6 | No. of Burners |
| 24 | 4″ | 4″ | 4″ | 4″ | 3″ | 3″ | Burner size Dia. |
| | 7 | 14 | 21 | 28 | 30 | 30 | No. ½″ Vent Holes |
| | 1 | 2 | 3 | 4 | 5 | 5 | No. of Burners |
| 30 | 6″ | 6″ | 6″ | 6″ | 4″ | 4″ | Burner size Dia. |
| | 10 | 20 | 30 | 40 | 40 | 40 | No. ½″ Vent Holes |
| | 1 | 2 | 3 | 4 | 5 | 5 | No. of Burners |
| 36 | 6″ | 6″ | 6″ | 6″ | 4″ | 4″ | Burner size Dia. |
| | 10 | 20 | 30 | 40 | 40 | 40 | No. ½″ Vent Holes |
| | 2 | 2 | 3 | 4 | 5 | 5 | No. of Burners |
| 42 | 6″ | 6″ | 6″ | 6″ | 6″ | 6″ | Burner size Dia. |
| | 20 | 20 | 30 | 40 | 50 | 50 | No. ½″ Vent Holes |

**MAXIMUM GAS CAPACITY OF URN TYPE BURNERS FOR 530 B.T.U. GAS**

| *Dia.* | *C.F./Hr.* |
|---|---|
| 2″ | 12 |
| 3″ | 20 |
| 4″ | 25 |
| 6″ | 36 |

## Integration Order Affects Four Ohio Companies

Under the Public Utilities Holding Act which seeks the geographical integration of utility systems, there has been ordered a consolidation of the following companies: Cincinnati Gas and Electric Co., Harrison Electric and Water Co., Loveland Light and Water Co., all with headquarters in Cincinnati, and the Hamilton Service Co., of Hamilton, Ohio.

All of these concerns will be merged into The Columbia Gas and Electric Corp.

## Natural Gas for Le Mars, Ia.

Residents of Le Mars, Iowa, were promised natural gas by January 1 in place of the carbureted water gas served in the past, according to T. F. Williams, manager of the Le Mars Gas Co.

Surveys have been made of the old distribution system and arrangements made for laying pipe and installing equipment necessary for making the changeover.

# Natural Gas—Now A Major Mid-Continent Development

• **BURT R. BAY, president, Northern Natural Gas Co., Omaha, Neb., in a paper, "Natural Gas Becomes a Major Mid-Continent Development," presented before the Mid-West Gas School and Conference, Iowa State College, Ames, Iowa, November 13 to 15, 1939.—(Abstract by G A S.)**

THE important place in the life and affairs of the mid-continent, now occupied by natural gas, may be summarized by saying that through the vision of the leaders of our industry and their willingness to risk capital in the construction of new enterprises, there are few sizeable communities within economic reach of the many natural gas pipe lines now in existence in this area, where natural gas has not been made available. Because of the comfort and convenience derived from its use, the people of the great Middle West have learned to look upon natural gas as the most commonly accepted fuel instead of a luxury fuel, as it has sometimes been regarded. Its use in industry has expanded in practically every area where it has been introduced until today we find natural gas fuel used in almost every known process employing heat for any purpose. It has not only contributed to the well being of our people, but to the growth of many of our cities and towns and daily furnishes employment to thousands in an industry which, for stability of employment, compares favorably with other public service institutions. To give one an idea of the size to which this enterprise of ours has grown, it can be said that the combined daily maximum capacity of the pipe lines which may be included as wholly existing or originating in the mid-continent area closely approximates three billion cu. ft.

B. R. BAY

### Sales Total

The combined annual sales of this group of companies is considerably more than 50% of the total for all of the United States, and when considered from the standpoint of underground reserves for future use and distances natural gas is transported for consumption, at prices which it must be remembered are competitive with other forms of fuel, there is no basis for similar comparison elsewhere.

Using American Gas Association statistics as a basis to further emphasize this point, it is found that of the total volume of natural gas sold in the United States in 1938, 53.7% was sold in mid-continent states or in other states whose main source of natural gas supply was from gas fields located in the mid-continent area. In the same states, the 75,910 miles of existing gas mains represented 40.6% of the total for the United States, the population represented 34%, customers 29.7%, and revenue 39.5% of the total for the United States for such year.

When it is considered that the revenues of the entire natural gas industry now considerably exceed 400 million dollars per year, we can better visualize the size to which this industry of ours has grown from the mere infant of 1889, producing about $15,000 of gross revenue annually, and the end of this expansion is not yet in sight unless we find our future growth hampered by the unreasonable exercise of power by regulatory bodies or too burdensome taxation.

### Sources of Supply

Touching briefly on that all-important thing, gas supply as it applies to the two largest single sources in the middle west, the Texas Panhandle gas field has nearly a million and a half acres of proven gas lands, and, at the present time, according to reputable geologists, contains an estimated total of 19 trillion cu. ft. of natural gas reserves, which includes both sweet and sour gas. At the current rate of withdrawal, this supply would last for 34 years.

The Hugoton gas field, located principally in southwestern Kansas and the Oklahoma Panhandle, has over two million acres of proven gas lands, which according to recent estimates contain about 16 trillion cu. ft. of natural gas. The combined estimated present reserves of the two fields totalling 35 trillion cu. ft. of gas, at the present rate of withdrawal from both areas would last for 61 years. This estimate assumes carbon black manufacture will continue at its present rate and that pipe lines now connected only with the Texas Panhandle source of supply will be extended ultimately to the Hugoton area.

Paul Ryan, chief statistician of the American Gas Association, in a recent release pointed out that over $2,700,000,000 of capital was required to provide natural gas service to the 7,220,000 customers of this great industry in the United States. It employs approximately 66,000 people and has an annual payroll in excess of $98,000,000. Referring to the amount of capital necessary to the maintenance of the high standard of service to which natural gas customers have become accustomed, he says that the automobile industry, back of each worker, has made an investment of capital of $3000; in the case of steel, this figure is about $7000; with the railroads, approximately $24,000; and for the average worker in the natural gas industry this investment of capital becomes $41,000. Speaking of customer acceptance of our product, Mr. Ryan makes reference to 68,000 new one-and-two-family homes constructed during 1938 in cities where natural gas was available. Of this total, 61,345, or 90.2%, used natural gas for cooking; 60,458, or 88.9%, for water heating; 7,161, or 10.5%, for refrigeration, and 52,904, or 77.8%, for house heating. Of the total, 6843, or 10.1%, of the homes employed natural gas for all of the "four big jobs."

Resorting to astronomical figures, he says that "for example, in 1938 the electric companies sold to consumers some 93 billion 400 million kilowatt hours. Reduced to a common denominator, or thermal basis, this amounted to 319 trillion British thermal units. During that same year natural gas utilities sold one trillion, 203 billion, 553 million cu. ft. of natural gas, which reduced to the same common denominator or thermal basis, amounted to 1203 trillion British thermal units, or nearly four times the quantity of energy distributed in the form of electricity."

### A Comparison

Adding that "If a buyer were in the market last year for a million British thermal units of energy, he could purchase them in the form of natural gas for $0.35, and in the form of electric energy for $6.82."

Coming closer to home, one might mention a fact concerning the popular appeal of natural gas for domestic use by pointing out that Peoples Natural Gas Co., one of the distributing subsidiaries of Northern Natural Gas Co., during 1939, obtained natural gas

**TABLE NO. 1.**

| Company | Date of Bond Issue | Rate | Maturity Yrs. | Maturity Date | Amount |
|---|---|---|---|---|---|
| Oklahoma Natural Gas Co. | May, 1936 | 4½% | 15 | 1951 | $17,709,000 |
| Southern Natural Gas Co. | October, 1936 | 4½* | 15 | 1951 | 12,939,000 |
| Mississippi River Fuel Corp. | February, 1937 | 4 | 15 | 1952 | 10,000,000 |
| Panhandle Eastern Pipe Line Co. | March, 1937 | 4 | 15 | 1952 | 24,000,000 |
| Colorado Interstate Gas Co. | June, 1938 | 3½ | 10 | 1948 | 10,384,000 |
| Lone Star Gas Company | August, 1938 | 3½ | 15 | 1953 | 20,000,000 |
| El Paso Natural Gas Co. | December, 1938 | 3½ | 15 | 1953 | 6,000,000 |
| Cities Service Gas Co. | December, 1938 | 3¼ | 8 | 1946 | 15,000,000 |
| Cities Service Gas Co. | December, 1938 | 3¾ | 16 | 1954 | 20,000,000 |
| Northern Natural Gas Co. | August, 1939 | 3¼ | 15 | 1954 | 16,000,000 |

*Since reduced to 4%.

franchises in 12 comparatively small cities and towns located in Iowa and Minnesota. The results of franchise elections in these 12 towns, which have a combined population of 17,089, reflected a total of 3635 affirmative votes and 643 negative votes. The negative vote in relation to the total vote cast was only 15.03%, and to the total of the adult or voting population was not more than 7% or 8%. In one small community there was not a single vote in opposition to the franchise and in another having a population of more than 5,000, only 14 voters said "no" to the introduction of natural gas.

Another phase of our industry's activities which has not been so prominently before the public is that pertaining to the financing of these major gas enterprises and the banker or public acceptance of gas pipe line company securities. There was a time in our history when it was difficult to borrow money to finance natural gas pipe line property except by burdening it with high interest rates and short maturities. That this does not hold true today is evidenced by the fact that within the last three years many natural gas companies have taken advantage of the gradually lowering trend of the cost of money and have refunded outstanding debt with new issues, principally mortgage bonds, under terms comparable with those of new issues put out by other utility and industrial concerns, all of which speaks well for the soundness and stability of our business. Some of the companies offering new bond issues are shown in Table No. 1.

As further evidence of the investment banker's viewpoint, the Autumn issue of the New York Trust Co.'s bulletin, *The Index*, carries the following comment about the Gas Industry:

"With more customers than it has served at any time in its history, with greater sales and revenues than it enjoyed in 1938, and with the continuation of sales and promotional activities which have proved effective, the gas industry seems to have reason to face the future with confidence. Its soundness has been tested during the depression and it has demonstrated its stability and its capacity for growth.

"In a difficult period the industry has succeeded in expanding its market both in domestic and in industrial uses. Through improvement of appliances it has made its product more acceptable to consumers. Confronted with changing business conditions and habits of living, the industry has shown itself flexible enough to take advantage of these changes to improve its position in a competitive field."

Truly, this is a progressive industry, filling a definite need and occupying a prominent place in the economic life of this generation. Through the years it has ably demonstrated its ability to cope with adversity, whether resulting from changed conditions or business depression, and to successfully meet the many forms of competition seeking the consumer's dollar. Fortified at this time with known reserves of gas, probably larger than at any time in history, we can look forward to the future with confidence. To those who have chosen employment in the gas industry as a vocation, it offers a splendid field of opportunity whether our interests lie in the routine duties of property operation, engineering, sales or research. Wage levels are considerably above the average, employment is stable, and the problems of the business are sufficiently diverse to create and hold one's interest as they embrace the risk in development associated with all oil and gas enterprises; constantly changing and ever-improved methods of construction, the use of new and improved equipment in the transmission of our product from the well to the ultimate consumer, and finally, selling that is competitive with other forms of fuel, which we must continue to meet.

## CALENDAR

**January**

**Louisiana Engineering Society** — Fifth Annual Meeting, St. Charles Hotel, New Orleans, La., January 12-13.

**February**

**Pacific Coast Gas Association Spring Sales Conference** — Held in conjunction with open house of the A.G.A. Testing Laboratory, Los Angeles, February 12-14.

**Southern Gas Association and Southern-Southwestern Sales Conference** — Annual Convention, Hotel Arlington, Hot Springs, Ark., February 12-14.

**March**

**New England Gas Association**—Annual Convention, Hotel Statler, Boston, Mass., March 14-15.

**April**

**Mid-West Gas Association** — Annual Convention, Lincoln, Neb., April 15-17.

**Missouri Association of Public Utilities**—Annual Convention, Elms Hotel, Excelsior Springs, Mo., April 17-19.

**Southwestern Gas Measurement Short Course**—College of Engineering, University of Oklahoma, Norman, Okla., April 16-18.

**May**

**International Petroleum Exposition and Congress**—Tulsa, Okla., May 18-25.

**Natural Gas Section, A. G. A.**—Annual Convention, Houston, Texas, May 6-10.

**July**

**Canadian Gas Association**—Annual Convention, Jasper Park Lodge, Alberta, July 3-5.

**Pacific Coast Gas Association Northwest Conference** — Held in conjunction with Canadian Gas Association, July 3-5.

**October**

**American Gas Association** — Annual Convention, Atlantic City, N. J., week of October 7.

## Gas Service Extended in San Bernardino Mountains

The Southern California Gas Co., Los Angeles has completed the construction of approximately 160,000 ft. (30 miles) of pipe line to furnish gas service to the resort of Crestline in the San Bernardino mountains, near San Bernardino, Calif.

In addition to Crestline, service is extended to the communities of Valley of Enchantment, Clifton Heights, Valley View Park, Skyland, Horse Shoe Bend, Great View, Arrowhead Highlands, Squirrel Inn, Strawberry Flats and Alpine Glens Park.

The main was installed up Waterman Canyon, the old Incline Road to Skyland, and thence east, and tied into the Lake Arrowhead system at Agua Fria, with lateral lines to supply the customers off the main line.

The need for gas service in this area is indicated by the fact that the company has received nearly 900 applications.

## American Gas & Electric Has Refinancing Plan

The American Gas & Electric Co., a major utility holding company in the Electric Bond & Share group, of New York, has announced a $65,000,000 debt refinancing plan.

A special meeting of stockholders was scheduled for Jan. 3 in New York to act on a proposal for issuance of new preferred stock and debentures to retire existing issues, resulting in savings in interest.

## Mountain Gas Co. Sold

The Mountain Gas Co., of Saranac Lake, N. Y., has been bought in at public sale by the Adirondack National Bank and Trust Co., acting as trustee for the holders of bonds secured by a mortgage executed by the gas company.

Gas will continue to be supplied to consumers, it was stated, and a reorganization of the business is planned in the near future.

## H. L. Doherty, Gas Executive, Is Victim of Pneumonia

HENRY L. Doherty, nationally known utilities executive, passed away in Philadelphia on Dec. 26, following a 10-day attack of pneumonia.

Mr. Doherty was born in Columbus, O., May 15, 1870, and left school at the age of 12 to work for the Columbus Gas Co., with which he remained for 13 years, working his way up from office boy to assistant manager. In 1896 he organized the Madison Gas & Electric Co. at Madison, Wis. Two years later he directed the merger of the Denver Consolidated Gas Co. and the Denver Gas & Electric Co.

In 1905 he formed Henry L. Doherty & Co., engaging in reorganization, management and financing of public utilities, and his organization grew so rapidly that in 1910 a separate holding company, the Cities Service Co., had to be formed. With this move Doherty entered the field of the production, refining, transporting and marketing of petroleum and its products.

In recent years he worked to bring about conservation of the country's oil resources. He was the first to outline a definite plan to prevent the waste of petroleum due to excessive drilling.

The manufactured and natural gas industries owe to Mr. Doherty a large number of the standard methods now followed in the production and distribution of their products.

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## Court Dismisses Dilution Suit Against Columbia Gas

The $42,000,000 damage suit against the Columbia Gas & Electric Corp. and four subsidiaries, Ohio Fuel Gas Co., Northwestern Ohio Natural Gas Co., Cincinnati Gas & Electric Co., and Dayton Power & Light Co., was dismissed in December on the grounds that the plaintiff erred in bringing suit in his own name and that of all other gas consumers. Attorney John L. Davies, of Columbus, brought the suit. Each individual must sue separately, the court ruled.

The suit charged that 700,000 consumers of gas in Ohio had suffered from dilution of gas, due to mixing of inert gases with natural gas. Counsel for the gas companies has defended dilution as necessary for efficient combustion and stabilization of the product.

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## Natural Gas Will Power Electric Generating Plant

The board of directors of the Rural Electric Cooperative decided that natural gas instead of Diesel fuel oil shall be used in the electric generating plant that will soon be built for consumers in Cochise and Graham counties. The generating plant will be located 32 miles south of Willcox, on the line which brings natural gas into Arizona as far as the Salt River valley.

About 700 consumers are already signed up for the cooperative's service.

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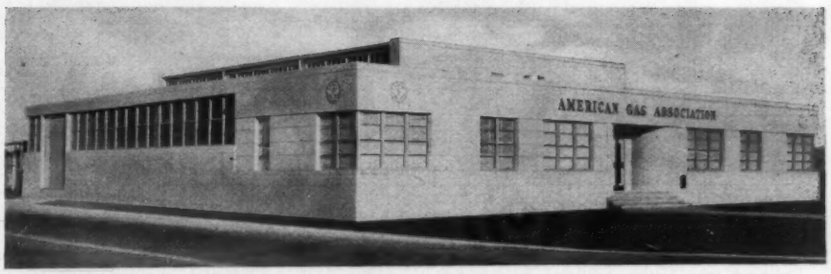
## Move Defeated to Form Public Utility District

Voters of Lane County, Ore., in an election Dec. 8, decisively defeated a proposal to form a public utility district, it was announced by Z. E. Merrill, president of Mountain States Power Co., a unit of the Standard Gas & Electric Co. system.

The measure failed to carry by a vote of 1775 to 2805, with two small precincts missing. The measure was defeated in the five incorporated towns, and also in the rural areas.




**The new Pacific Coast branch of the American Gas Association Testing Laboratories.**

# P. C. G. A. Plans Spring Sales Meeting for February 12-14

THE Pacific Coast Gas Association Spring Sales Conference will be held in Los Angeles February 12, 13, and 14 in conjunction with the Open House of the new American Gas Association Branch Laboratory recently completed at 1412 Grande Vista St., Los Angeles.

A. F. BRIDGE

Plans for the open house ceremonies are being formulated by Arthur F. Bridge, vice-president and general manager of the Southern Counties Gas Co. and a member of the Laboratory Managing Committee. The open house will bring to Los Angeles many prominent eastern gas men, including officials of the American Gas Association and members of important Laboratory committees. The new Laboratory was made necessary by the rapid development of gas appliance manufacturing on the Pacific Coast, placing a burden of over five times the volume of testing work on the Laboratory than existed in 1935.

Under present tentative plans, February 12 and 13 will be set aside as Gas Appliance Dealer days, the 14th for utility men, and the 15th for manufacturers.

The Laboratory staff will act as guides to explain all details in Laboratory procedure and demonstrate some of the more important testing facilities.

Plans for the Sales Conference are to be in charge of A. F. Rice, chairman of the Association Sales and Advertising Section. General meetings to discuss sales problems are to be held on February 12 and 13, followed on the 14th by a meeting of the Sales and Advertising Section Executive Committee. Mr. Rice is planning a unique program designed to bring to the front the younger men of the industry, and the discussion of actual problems from the "firing line." The procedure being followed by Mr. Rice to attain this end is offering some $300 prize money to be distributed to members of utility sales staffs who present through their executives problems or sales wrinkles which are judged worthy of having a place in the program. For every contribution placed on the program of the conference its author will receive $10 and thus become eligible for the principal prizes of $25 each of three classifications — Domestic, Commercial and Industrial, and Home Service.

The meetings will be held at the Embassy Auditorium, Grand and 8th Streets, Los Angeles, within two blocks of the Gas Companies' main office.

The changeover from the old Testing Laboratory site to new quarters was accomplished in three days. The new building will provide over three times as much room for testing as the old building and will also assure ample facilities to handle the anticipated expansion of local industries for some time. Adjacent to the building is a 10,000 square yard lot which will provide parking space for visiting manufacturers as well as for any future expansion of the new building.

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## United Gas Corp. Moves Into New Houston Offices

The United Gas Corp. moved into its newly remodeled and redecorated 10-story United Gas building at Texas and San Jacinto streets, Houston, Texas, in December.

The general offices of the company will occupy 20,000 sq. ft. on the upper floors, and the Houston division is established on the first, second and third floors. Other space in the building has been leased to the United Gas Pipe Line Co. and the Union Producing Co.

# SALES Slants

## A New Problem Every Minute

One of my acquaintances is a manufacturer with an engineering mind. He confided in me recently that all his life his one regret is that he is not a salesman.

"But you are a salesman," I told him. "You are successful. You are the head of a large business. You sell yourself, your ideas to those around you."

"Yes, but I do not mean in that way. I mean I wish I had the ability to go out and make sales, actual sales, to strangers, as my men do."

"How do you know you couldn't?" I asked.

"My training has all been against it," said he. "I am an engineer, a researchist. My job is one on which I can spend hours, days, weeks, months if need be ferreting out the answer to a problem. But the salesman cannot be leisurely. He works with new problems every minute of every day. I think he has to have a higher degree of intelligence—certainly more social intelligence—than any other man in business."

Upon thinking the matter over, I believe that this gentleman is absolutely right. It hadn't struck me so forcibly until I heard him put it in the way he did.

## Let Him Crab

Sometimes your prospects want to crab, crab, crab, find fault, criticize, abuse. Many salesmen are thrown for a loss when this happens to them. They let the crabbing prospect get them all upset.

What do salesmen do with the person who wants to crab?

The answer: *Let him crab.*

The best way to handle the man who crabs and finds fault, who wants to tear you and the gas company limb from limb, who sees something wrong with the government, the country, the world, is to let him talk it off. Don't object. Don't interrupt. Don't argue. Just listen.

If he thinks he has an honest grievance, hear him out. Sympathize with him. And then when he has cooled himself off, go in and sell him.

Once on my sales force I had a middle-aged, gray-haired woman who was sure-death for crabbers. Whenever we ran into a mean one we invariably sent her to see him, and she invariably came back with the order.

I asked her how she did it and she told me: "I guess it's my maternal instinct at work. They don't impress me as big grown up business men at all, but as little boys having a little boy tantrum. I treat 'em just as I used to treat my little boy, Jack—just listen to them, soothe them. And they buy."

Soothe them, don't fight them—there's your rule in handling the crabs.

## Can You Take It?

I sat in a chair next to the desk of an eminent personnel man while he winnowed out the chaff from the wheat among the applicants for sales jobs with his big firm.

He asked these applicants many questions which I thought were impertinent. This struck me as strange. He isn't an impertinent man usually, but a soft spoken, considerate gentleman.

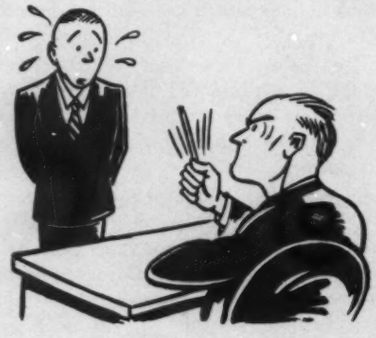
One thing he did that I considered to be very bad taste was to criticize every applicant, not in a generous, gracious way, but bluntly, like a man of no breeding.

When the last one had gone through the mill, he turned to me, smiled in his usual gracious way and said: "Well, that's done, I'm sure I enjoyed it less than those lads did."

"Enjoyed what?"

"The razzing I gave each. Didn't you notice?"

"Oh, was that purposeful—an act you put on with a motive?"



"Why, bless you, of course it was! Do you think I'm the kind of a man I was when I was talking to those boys?" he demanded.

"I didn't think so. But tell me why you baited them so mercilessly."

"To see how many of them could stand criticism," said he. "You noticed that I found fault with each of them, did it in a very personal, almost insulting, way, didn't you?"

"Yes."

"I want to see if they could take it. A salesman who can't stand criticism can't sell: his customers are going to criticize him, or his goods, or the house sooner or later. If he blows up and wants to fight back, he's temperamentally unfitted to sell. You can't be a salesman and a sorehead at the same time," he concluded.

The man he hired for the job was a big, jovial fellow with a sense of humor, a man who could laugh at himself and was impervious to the shafts and barbs of criticism.

"That boy will go far," said the personnel man.

I looked in the other day to see how far he had gone. The man who could take it is already assistant sales manager.

## Twin Brothers

Every day a man in the selling end of business gains an extra dividend for himself, for his company and for his customers. In time it is these extra dividends, which come without extra effort whatever, that make a great and a successful salesman.

This comforting conception of salesmanship is that of one of the highest minded business men I have ever known, Adolph Coors, Jr., head of a nationally famous business.

"There is a cumulative effect of a salesman's work," Mr. Coors believes, "that most of us, especially the salesmen themselves, are prone to overlook."

"Just what do you mean?" I asked him.

"This: Each time the salesman calls upon a customer, whether he sells him or not, he gains something. He gains a little more of his confidence, a little more of the customer's friendship."

"I see."

"He has made a little deeper impression upon the customer," Mr. Coors continued. "In time, the customer looks upon the salesman as a steadfast friend, one with whom it is a pleasure to do business. The sum total of these friendships spells success for any salesman. The cumulative effect of a salesman's work is greater than that of any other profession."

"Then it must be a grevious mistake to high-pressure customers, quarrel with them, do anything except show that you are just a friendly person, with a friendly company, engaged in a friendly business—isn't that about the picture?" I asked.

"I think it is," said he. "Salesmanship and friendship are twin brothers. And the older a friendship becomes, the more valuable."

■ ■

## Montana-Dakota's "World's Fair" Sale Contest Closes

The Williston, N. D., division of the Montana-Dakota Utilities Co., Minneapolis, has won the "World's Fair" sales contest that offered a prize of a free trip to either the New York Fair or the San Francisco Fair for the manager of the winning section. The campaign ran from Aug. 14 to Nov. 25. V. M. Cleveland, manager of Williston, now has his choice of fairs to attend when they reopen next spring.

The runner-up in the campaign was the Glasglow, Mont., division, with Great Falls, Mont., third.

This is the second sales contest won by Williston this year, the first being known as the "Round-Up" campaign, held last April, May and June.

To the winner, Williston division, also goes temporary possession of the Heskett trophy, which has been presented each year since 1932 to winners of sales contests. The trophy is presented in honor of General Manager R. M. Heskett.

The World's Fair campaign resulted in gas appliance sales totaling $78,807 and in electric appliance sales of $16,674, the grand total being $95,481.

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## Brooklyn Union Refrigerator Sales Total 21,000 in 1939

The Brooklyn Union Gas Co. went over the top in its 1939 gas refrigeration sales quota when on Dec. 14 there was recorded a total of 21,000 refrigerators sold, claimed to be a greater number than was sold by any other company in the United States during the same period.

This achievement in sales was the result of the year-long "ring-a-million-doorbells" campaign which was participated in not only by the company's sales force but by company employes in all capacities.

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## Over 10,000 Units Sold In So. California Range Drive

Final tabulations on the Clock Control Range Campaign of Southern California and Southern Counties Gas Companies, Los Angeles, which was in effect between September 11 and October 31, 1939, indicate that more than 10,000 units have been sold. Throughout the campaign each buyer of a CP range received without cost the automatic clock control, the cost of which was borne jointly by the manufacturers and the utilities which sponsored the campaign.

■ ■

## Republic Adds Home Service

A new home service department has recently been organized by the Republic Light, Heat and Power Co., Buffalo, N. Y., with Helen Kirtland as director. Miss Kirtland was previously with the Rochester Gas and Electric Corp.

# Gas Performs Magic Feats At Allegheny County Fair

FRYING bacon on a paper plate over the lighted Giant burner of a modern gas range was one of the feats which astonished people who visited the exhibit of the Equitable Gas Co. of Pittsburgh at the Allegheny County Fair. Ann Sutter of Equitable's home service department reports unusual interest taken by the public in demonstrations designed to illustrate outstanding features of the CP range and Servel refrigerator. To the comments aroused by the bacon-frying act the home service girls replied, "Burners on modern gas ranges are so efficient and gas itself so easily controlled you have no occasion to worry that these paper plates will burn."

Another demonstration which caused considerable comment was the baking of an angelfood cake in a preheated oven of 425° with the gas turned off 10 minutes after the batter was placed in the oven, and the baking finished by the heat retained in the oven, thereby showing how efficiently the oven was insulted.

Also very popular, and again demonstrating insulation, was the wrapping of ice cubes in a piece of the insulation and baking them with biscuits. "The biscuits baked and browned perfectly," says Mrs. Sutter, "but you couldn't tell the ice cubes had ever been in the oven."

Visitors at the booth were so skeptical of a 17 lb. cake that was baked in the oven that the cake had to be cut in order to prove it was all cake.

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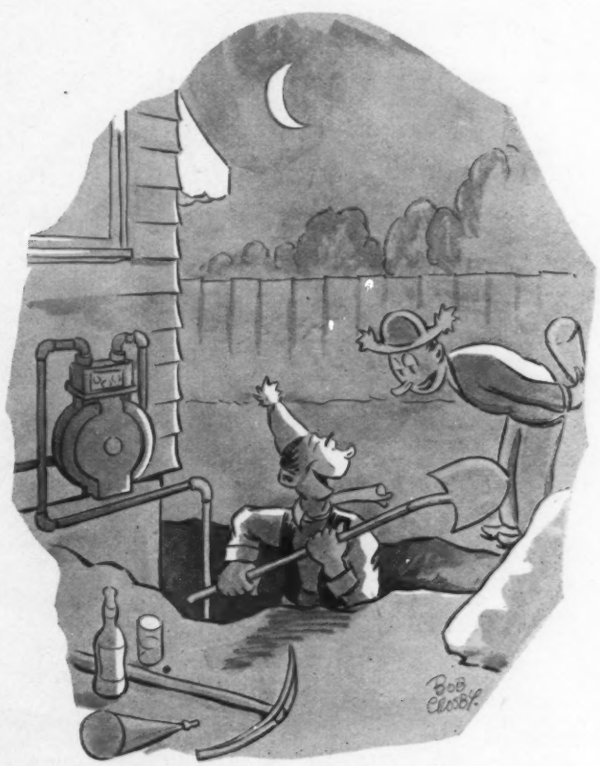
## Color Features Full Page Ad Of Laclede Gas Light Co.

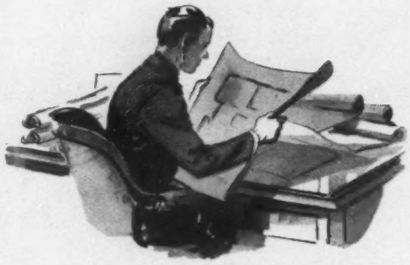
Announcement last fall of a new low schedule in rates for consumers served by the Laclede Gas Light Co., of St. Louis, was featured by a full page ad in color in local newspapers. Sparing but effective use of red ink retained the dignity of other advertising copy but increased the attention value, according to R. D. Lewis, advertising manager of the company.

## DOTTED LINE ROSCOE




"The Boss says, 'Know your product,' so I'm gonna start the new year by findin' out where this gas comes from!"

# 1940 ADVERTISING CAMPAIGN FOR GAS REFRIGERATION



*More than*
**21,000 ARCHITECTS**

*More than*
**50,800 BUILDERS**

*More than*
**17,600 OWNERS**

**A TOTAL CIRCULATION OF MORE THAN 141,000 READERS**

BUILDER
"I have had Servel Electrolux refrigerators installed in my property since 1932. My tenants praise Servel Electrolux silence, dependability and constant cold, and find this different refrigerator has an extremely low operating cost."
Mr. J. H. Wolfson
210 Republic Bldg.
Denver, Colo.
More and more BUILDERS AND TENANTS WANT SERVEL'S SILENT FREEZING WITH No Moving Parts
TENANT
"I find the operating expense a dollar a month, have never had any expense for service or service parts. We are very well pleased and particularly like its silence and absence of moving parts. Am glad of my landlord's selection."
Mrs. Simeon Anderson
5148 N. Christiana
Chicago, Ill.
Different from all others:
• NO MOVING PARTS in its freezing system
• PERMANENT SILENCE
• CONTINUED, LOW OPERATING COST
• MORE YEARS OF SATISFACTORY SERVICE
• SAVINGS THAT PAY FOR IT
The 1940 SERVEL ELECTROLUX Gas Refrigerator
SPECIFY THE REFRIGERATOR THEY HEAR ABOUT · BUT NEVER HEAR

● Monthly ads in Architectural Forum, American Builder and Building Age, Building & Building Management, and National Real Estate Journal will tell the story of gas refrigeration's exclusive advantages to more than 21,000 architects . . . 50,800 builders and contractors . . . 17,600 owners . . . a total circulation (including these and other classifications) of more than 141,000 readers.

# AIMED AT NEW OPPORTUNITY IN BUILDING FIELD

## Servel Will Reach the Men Responsible for Specifications to Help You Sell More Servel Electrolux Refrigerators

**Two factors** in the building field which are making it increasingly profitable for utilities to promote gas refrigeration are (1) increasing new construction and (2) modernization.

Current indications for the immediate future of business in general and for the building trade in particular seem to point to certain continuation of this pattern in 1940.

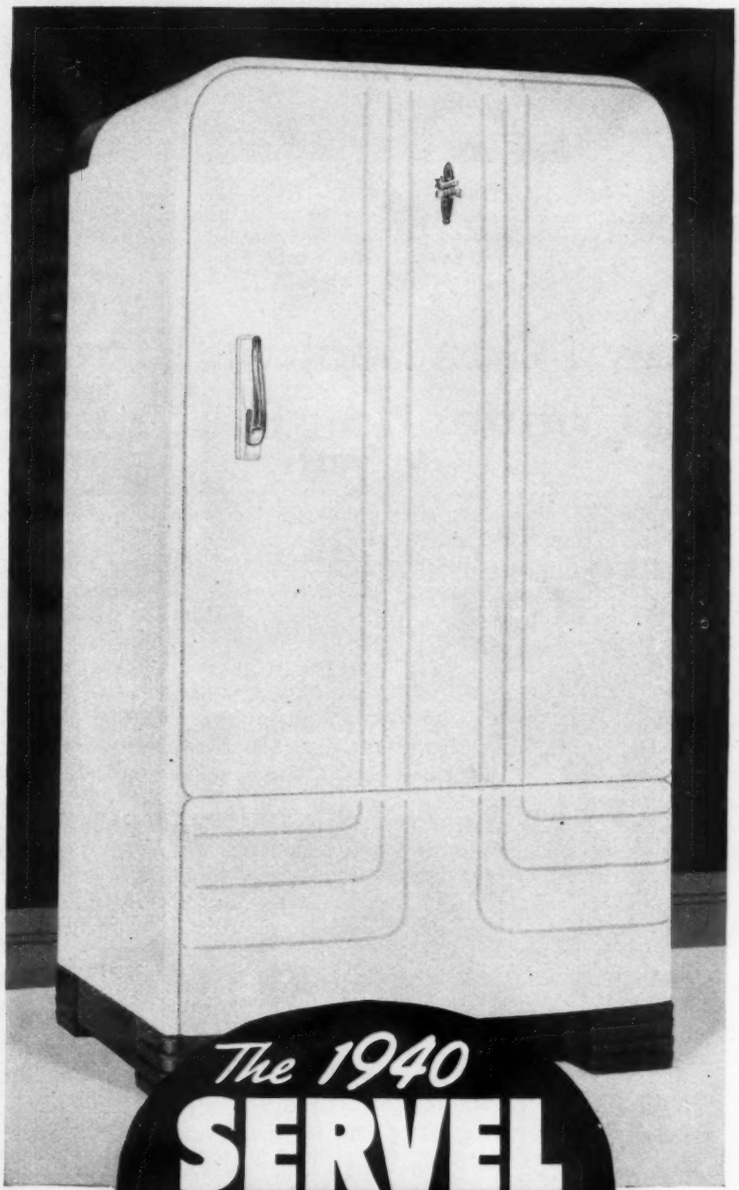
In order to help you take the greatest possible advantage of this opportunity, Servel this year is aiming its trade advertising at the men who are going to be responsible for the specification and installation of refrigerators in new and modernized buildings.

### Ideal for Replacement Sales

In both cases, past experience—either first hand or otherwise—is a great influence in favor of gas refrigeration.

For there is a growing demand among both owners and tenants for the permanent silence of the freezing system with no moving parts which only gas refrigeration can give them. In the case of modernization, more and more owners are replacing other types of automatic refrigeration with Servel Electrolux for its lasting efficiency.

Servel's advertising is going to pound home these facts to the men you are trying to sell. It will be worthwhile for your company to map out its 1940 campaign to go after this market.



Committee chairmen of the A.G.A. Natural Gas Section: Transmission, George S. Young, Michigan Gas Transmission Corp.; Domestic Natural Gas Sales, Davis M. DeBard, Stone & Webster Service Corp.; Industrial Natural Gas Sales, Franklin T. Rainey, The Ohio Fuel Gas Co.; Production, J. French Robinson, The Peoples Natural Gas Co.; General Program, C. H. Waring, The Kansas City Gas Co.

# Natural Gas Section Plans 1940 Convention Program

IN order to formulate plans for the year's work as well as the program for the annual convention at Houston, Texas, May 6-10, 1940, the General Program Committee and other committees of the Natural Gas Section, American Gas Association, met at the Palmer House in Chicago, December 11.

It was announced at the Chicago meeting by C. H. Waring, chief engineer of the Kansas City Gas Co. and chairman of the American Gas Association Distribution Conference that the 17th annual meeting of that group will be held jointly with the Natural Gas Section Convention in Houston. Headquarters of both meetings will be the Rice Hotel.

In the absence of General Program Chairman Harry D. Hancock, vice-chairman of the Natural Gas Section and president of Gas Advisers, Inc., New York, Thomas R. Weymouth, past chairman of the Natural Gas Section and vice-president of Columbia Gas & Electric Corp., New York, presided.

Chairman George S. Young of the Michigan Gas Transmission Corp. presided over the Transmission Committee, and J. French Robinson, chairman of the Production Committee and president of The Peoples Natural Gas Co., presided over that meeting. The Domestic Natural Gas Sales Committee was headed by Chairman Davis M. DeBard, vice-president of Stone & Webster Service Corp. Franklin T. Rainey, general sales manager of The Ohio Fuel Gas Co., presided over the Industrial Natural Gas Sales Committee of which he is chairman.

The program of the Transmission and Production Committees is cast along practical operating lines, in connection with new developments of their respective activities. The sales committees have outlined a program in keeping with the tempo of the promotional activities of the American Gas Association as applied to the Natural Gas Industry.

Subjects and speakers already selected indicate an unusually vital and well attended program. Many natural gas men are planning to be in Houston from May 6-10.

■ ■

## Industrial Uses of Gas Shown in A.G.A. Ad Series

Picturing the way in which gas is utilized in different industries, special advertisements were prepared in December by the Industrial Gas Section of the A.G.A., in cooperation with the Committee on National Advertising. These advertisements ran in 17 publications going to nine different fields as a part of the national advertising campaign. Gas was shown being used in a steel plant, paint plant, ceramics plant, hotel, hospital, college, lunch counter, cookie plant, bakery, and in a forging plant.

■ ■

## Chicago Utility Head Dies

James Simpson, 65, chairman of the board of the Public Service Co. of Northern Illinois, Chicago, died Nov. 25 at his home in Chicago, after an illness of two weeks. Mr. Simpson was formerly chairman of Marshall Field & Co.

## Southern Natural Completes 32-Mile Mississippi Line

THIRTY-TWO miles of natural gas steel pipe line, laid through a swamp normally covered by from 5 to 30 ft. of water, has been completed by Southern Natural Gas Co., Birmingham, Ala. The line was constructed by B. & M. Construction Corp., Oklahoma City, Okla., which started the work Oct. 22 and completed the job Nov. 10.

The line runs from the gas company's compressor station, at Onward, Miss., to a point due south of Yazoo City, Miss. The line is 18-in. O.D., with 1350 couplings and 2800 electric welds. It parallels a 22-in. existing line of the Southern Natural and will provide more gas at Yazoo City, where the load is increasing rapidly.

When the line was completed it was given the bottle-tight test for 48 hours with pressure at 425 lbs. per sq. in., and not one leak was developed, according to Wm. V. Montin, secretary-treasurer of the B. & M. Construction Corp.

The contractor took advantage of a dry period but the ground was wet and soft in places. Mats were used over which to run the Diesel power tractors, two big ditching machines, and other equipment. An average of 600 men were employed and they laid about 8000 ft. of pipe per day.

Extra precautions were taken to protect the line. It was covered with a 3/32-in. coat of hot tar and laid in a ditch 3 ft. wide and 5 ft. deep, throughout its course. The new line cost approximately $500,000.

■ ■

## P.U.A.A. To Hold Meeting In Denver, January 12-13

The annual Western conference of the Public Utilities Advertising Association will be held on January 12 and 13 at the Hotel Cosmopolitan, Denver, Colo., according to an announcement by E. K. Hartzell, Bristol, Tenn., president of the Association, who stated that a record-breaking attendance is expected.

Frank R. Jamison, director of publicity and advertising, Public Service Co. of Colorado, is in charge of arrangements, and details of the program have been placed with a committee under the chairmanship of Harold J. Rowe, Iowa Electric Light and Power Co., Cedar Rapids, Iowa.

A feature of the utility meeting will be a joint session with publishers and advertising representatives of the Colorado and Rocky Mountain area, according to Mr. Hartzell. On Saturday night, January 13, delegates will be guests of the Public Service Co. of Colorado at a banquet.

■ ■

## Community Natural Co. Holds CP Range Essay Contest

In an essay contest conducted by L. M. Scholl, superintendent of the Corsicana division of the Community Natural Gas Co., Dallas, Texas, entitled "Why I Want a Certified Performance Range in My Home," first prize of $10 went to Lorah Mae Petty, of Hillsboro, daughter of a company plant foreman; second prize of $5 went to Mrs. F. F. McEwin, of Hillsboro, wife of a new business solicitor in that city; and Mrs. Ross L. Dixon, whose husband is Athens district manager for the company, won third prize of $2.50.

The contest was open only to wives, mothers, and sisters of employes of the Corsicana division. Employes were not eligible. Each contestant could dwell on only one reason for wanting a CP gas range.

# *Three Reasons** You'll Want Complete Information About the New 1940 DETROIT JEWEL and GARLAND Gas Ranges . . . *Now!*

**1** Prices go way down. They're priced to sell EVERY prospect, from families that live on the "wrong side of the tracks," right up to the wealthiest!

**2** EVERY model—AT ANY PRICE—has these wanted features:

- Automatic Top Lighter
- Chrome Burner Pan
- Porcelain Top Grates
- Oven Heat Control
- Flush Cooking Top
- Recessed Base
- Smokeless Broiler Grill
- Pull-out Roller Bearing Drawer Broiler
- Sanitary Oven Tray
- Insulated Oven
- Stainless Porcelain Top
- Folding Cover Top
- Aluminum-Nickel Top Burners
- Inner-Seal Oven Door Construction

Some Models Have as Many as Sixteen Additional Features . . . Every One a Sale-Closer!

**3** They'll be nationally advertised throughout 1940 in . . . . Saturday Evening Post, Woman's Home Companion, Good Housekeeping, and McCall's Magazine.

See our permanent exhibit at 1469 Merchandise Mart, Chicago.

* There are plenty more reasons why these brilliant new Detroit Jewel and Garland Ranges are destined to help dealers and gas companies set new range sale records in 1940. Send for complete descriptions and prices.

DETROIT - MICHIGAN STOVE CO.
DETROIT

At the December 4 meeting of the Industrial Gas Section's new General Sales Committee. Around the table (back to camera): E. L. Stauffer, South Carolina Power Co.; A. A. Schuetz, Milwaukee Gas Light Co. (substitute for B. T. Franck); George F. B. Owens, Brooklyn Union Gas Co.; Eugene D. Milener, secretary, Industrial Gas Section; Chairman H. Carl Wolf, Atlanta Gas Light Co.; George Duane, Dayton Power & Light Co.; Frank H. Adams, Surface Combustion Corp.; R. A. Maloney, The Bridgeport Gas Light Co.; Franklin T. Rainey, The Ohio Fuel Gas Co.; C. F. Henness, Public Service Company of Northern Illinois; Christy Payne, Jr., The Peoples Natural Gas Co.

# Industrial Section Forms General Sales Committee

A NEW committee of the American Gas Association Industrial Gas Section, the General Sales Committee, held its first organizational meeting at the Hotel Commodore, New York, December 4, and set for itself objectives and 1940 assignments, distinctly different from those heretofore tackled by any committee of the section. The new Committee's interest will be entirely "horizontal" (rather than specialized, or "vertical," and directed at one specific aspect of the gas-for-business-purposes market). It will stick to broad non-residential gas sales angles, and attempt to report its findings in a form such that the top men of the industry can digest them in a minimum of time, with general company policy in mind, and without going into technical detail and long case history records.

H. Carl Wolf, president, Atlanta Gas Light Co., Atlanta, Ga., is chairman of the new Committee, and its membership is made up of industry executives and captains of non-residential gas sales activity from various sections of the country.

The two specific objectives decided upon were: (1) to evaluate fully the industrial load (and the direction in which it is heading) so that for the first time complete national information will be available on the basis of which to interpret local non-residential gas sales situations, and (2) to give the non-residential sales manager facts and suggestions useful in planning his activities in joint council with management. Subcommittees were appointed to develop a suggested form of questionnaire to use in accomplishing the evaluation, to devise means of standardizing and summarizing the sales "meat" in the reports of all other committees of the Section (constantly working on special phases of the industrial gas sales problem), and to assemble ideas and case histories of successful ventures in general educational and promotional work in the industrial gas field.

Subsequent to the first meeting of Mr. Wolf's new group, the Managing Committee of the Industrial Gas Section, on December 5, reviewed the General Sales Committee's decisions and endorsed its proposed plan of action.

■ ■

## Natural Gas Co. Enters New Lisbon, Ohio, Office

The Natural Gas Co., of West Virginia, has recently moved into new office quarters in Lisbon, Ohio, a long-term lease having been taken on space in the Hotel Wick. Offices were formerly located in the Adams carriage factory building, which is owned by the company. J. A. Harwood is general manager.

■ ■

## Industry Pioneer Dies

W. E. Reardon, a pioneer in the natural gas industry in Louisiana and Texas, died at Monroe, La., November 16, at the age of 58 years.

## Eastern Gas Companies Launch Radio Program

EIGHT gas utility companies of New York City and the nearby territories of Westchester, Long Island and New Jersey, started on Dec. 4th their first sponsorship of a commercial radio program in a dozen years. It is titled "Home Harmonies," and presents the music of the organ-like Novachord.

The companies sponsoring the new broadcast are the Brooklyn Borough Gas Co., Brooklyn Union Gas Co., Consolidated Edison Co., Kings County Lighting Co., Long Island Lighting Co., New York and Richmond Gas Co., Public Service Co. of New Jersey, and Westchester Lighting Co. The 15-minute program is offered six days a week.

The program's selling messages stress the four big household uses of gas—for cooking, refrigeration, house heating and water heating—and invite listeners to have a representative of their own gas company call and show them how they can solve their house heating and hot water problems efficiently and economically with gas service.

The agency is Batten, Barton, Durstine and Osborn.

■ ■

## Conditional Contract Opens Way for Hastings, Neb., Gas

Last month the city council of Hastings, Neb., entered into a conditional contract with E. W. Dahlgren, of Oklahoma City, Okla., to provide the city with a municipal natural gas system. Its successful culmination depends upon the ability of Mr. Dahlgren and associates to contract for a satisfactory supply of gas and a total load of more than 2,000,000,000 cu. ft. annually, and a favorable vote upon the proposal by Hastings citizens. The election will also determine whether the existing plant, owned by the Central Power Co., shall be purchased or the city establish its own plant.

The survey leading up to the decision of the council was conducted by F. E. Devlin, of Kansas City. Should the proposal go through, the city agrees to purchase from 600,000,000 to 800,000,000 cu. ft. annually.

■ ■

## Texas College Schedules Welding Conference

The fourth biennial welding conference on electric and oxy-acetylene welding of the Texas Technological College has been announced for Feb. 2-3. There will be no charge for registration, but inquiries should be addressed to J. C. Hardgrave, in care of the college at Lubbook, Texas. More than 300 attended last year.

In addition to the papers which will be read, illustrated by slides in many instances, during the two-day meeting, there will be several demonstrations of various kinds of welding, and a banquet on the evening of the first day's session.

■ ■

## Iowa Central Utilities Co. Sold To George Donovan

The plant and gas distribution facilities of the Iowa Central Utilities Co. in Perry, Iowa, were sold to George Donovan, of St. Paul, last fall, according to news reports. The new concern will be known as the Perry Gas Co. and will not be operated as a corporation as Mr. Donovan is said to be the sole owner.

The new owner is interested in other gas utilities in Kansas cities and in New York State and has been concerned in large construction contracts involving many gas and electric plants.

## Merger of 14 Companies Planned by Columbia Gas

COLUMBIA Gas and Electric Corp., Wilmington, Del., holding company for 33 subsidiaries, plans to merge 14 of the controlled companies into three large operating units. According to Edward Reynolds, president, it is expected this transaction will simplify gas distribution in Ohio, Kentucky and Pennsylvania by reducing the number of operating companies to 22.

One part of the plan will be the merger of eight companies whose combined assets are $101,979,000, serving the Pittsburgh vicinity. These are the Manufacturers Light & Heat Co., Fayette County Gas Co., Greensboro Gas Co., Manufacturers Gas Co., Natural Gas Company of West Virginia, and Pennsylvania Fuel Supply Co., all of Pittsburgh, and Cumberland & Allegheny Gas Co., Cumberland, Md., and Gettysburg (Pa.) Gas Co. The combined utilities will be known as Manufacturers Light & Heat Co., the largest of the group. All negotiations are subject to approval of the Pennsylvania Public Utilities Commission.

The other two operating units to be organized by Columbia's merging of utilities will affect gas distribution in West Virginia, Kentucky and Ohio.

■ ■

## Natural Gas By-Products Displayed by Mines Bureau

Hundreds of products that can be derived directly or indirectly from natural gas formed part of the display of the United States Bureau of Mines station at Bartlesville, Okla., the last week in November. Women's "silk" stockings, bathing suits, fishing leaders, surgical sutures, tooth brush bristles, printing plates, rubber gloves, rubber balls, synthetic motor fuel, lubricants and edible fats are some of the ones that were on exhibition.

Harold Smith, petroleum chemist, and Boyd Guthrie, associate chemist, explained that there are four ways of obtaining by-products from natural gas, (1) by breaking natural gas hydrocarbons into fragments by heat or catalysts; (2) by introducing oxygen into the hydrocarbons by means of heat or catalysts; (3) by introducing elements such as chlorine into the hydrocarbons by heat or catalysts; and (4) by treating the hydrocarbon gases with hot nitric acid, producing nitro-hydrocarbons.

■ ■

## Worthington Pump Takes Over Oklahoma Concern

Beginning December 1, 1939, the business heretofore carried on by Worthington Machinery Corp. of Oklahoma at 424 North Boulder Street, Tulsa, Okla., will be taken over direct by Worthington Pump and Machinery Corp. as its district office and at the same address. The district manager will be J. O. Lewis, already well known in this territory.

Worthington Machinery Corp. of Oklahoma will remain in existence for the present to settle current business and to collect its outstanding accounts.

■ ■

## Houma, La., Now Being Served With Natural Gas

The pipe line that carries natural gas from the Lake Long field in Louisiana of the Fohs Oil Co. to Houma was completed in early December and gas was turned into the city mains for immediate use.

Brown & Root, Inc. were the contractors for the municipal system.

# Southern Gas Association Makes Convention Plans

THE Southern Gas Association's 1940 annual convention will be held at the famous health resort, Hot Springs, Ark., February 12-14, in conjunction with the Southern-Southwestern Sales Conference. Sessions will be held at the Hotel Arlington.

C. H. ZACHRY

C. H. Zachry, president of the Association, has announced the appointment of the following Special Membership Committee, which will function between now and the close of the convention:

F. S. Kelly, Jr., Arkansas-Louisiana Gas Co., Shreveport, La.; C. P. Rather, Southern Natural Gas Co., Birmingham, Ala.; C. B. Wilson, Arkansas Natural Gas Co., Little Rock, Ark.; E. J. Stern, Georgia Public Utilities Co., Atlanta, Ga.; H. G. D'Spain, Mississippi Public Service Co., Amory, Miss.; J. R. Cole, New Mexico Gas Co., Santa Fe, N. M.; J. H. Warden, Oklahoma Natural Gas Co, Tulsa, Okla.; A. J. Goss, Chattanooga Gas Co., Chattanooga, Tenn.

W. E. Derwent, George D. Roper Corp., Rockford, Ill., has been appointed chairman of the Membership Committee, in behalf of the manufacturers. Chairmen in other states are now being appointed.

The governor of Arkansas, Carl Bailey, will be a featured speaker on the opening day of the convention. His topic will be "Freight Rate Equalization for Southern States."

■ ■

## Oklahoma Utility Financed by $260,000 Bond Issue

The Guthrie Gas Utilities Co. of Guthrie, Okla., has recently been refinanced by Dallas Rupe & Son, Dallas, Texas, and William N. Edwards & Co., Fort Worth, investment bankers, who have agreed to underwrite a $260,000, 10-year, 5% first mortgage bond issue. E. R. Bahan, executive vice president of the Guthrie Co., conducted negotiations for his company. According to D. Gordon Rupe, Jr., trustee for the bond, the issue will be privately placed.

The financing is said to be the largest private utility deal to be undertaken in recent years exclusively by Texas capital.

■ ■

## Home Service Work Started

The Union Gas System at Independence, Kan., has recently set up a home service department, of which Helen Bradley is director. Miss Bradley has made a series of home calls, given a group of employe dinners, conducted four sessions of the bride's school and nine cooking classes in connection with the home economics department of the city school system, and given a demonstration at a church food fair. Miss Bradley was formerly with the Kansas City Gas Co.

**The kitchen in the Mecca Cafe, Tacoma, Wash., is equipped with Magic Chef broiler fired by both gas and charcoal and Magic Chef ranges equipped with top control on the fry top. Operated by A. G. and Phil Hoskins, the Mecca has been established 30 years, serves between 1000 and 1500 meals per day. The operators had previously used oil, but since adopting gas find their kitchen to be cooler, their costs lower. The Washington Gas and Electric Co. recently sold and installed the equipment.**

**GASAIR**

**GASAIR MIXERS AND VAPORIZERS**

*150 to 50,000 C. F. H. Capacity*

●

**GASAIR VAPORIZERS**

*For Straight Vapor Installations*

***ELIMINATE UTILITY & INDUSTRIAL SHUT-OFF***

*"The Only Complete Gas-Making Unit Operating Without Outside Power"*

●

**GASAIR CORPORATION**

*John K. Heller, Pres.*

155 Sansome Street, San Francisco

Telephone YUkon 1435

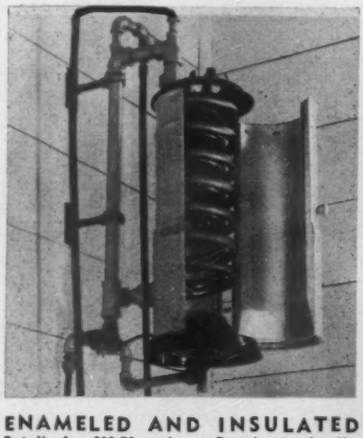
**STANDBY**



*Hotomatic*

**KITCHEN SINK GAS WATER HEATER**

Thermostatic — Instantaneous



**ENAMELED AND INSULATED**

Retails for $22.50 and up. Regular trade discounts allowed.

Can be set up in a few minutes with slip-on connections.

Heats 50 gallons per hour; continuous flow; hot coil storage, 1 gallon.

Suitable for low-income bracket customers, offices, apartments, small restaurants, small barber shops, tourist cabins, and booster heater.

Place orders allowing 60 days delivery.

**LITTLE GIANT WATER HEATER CO.**

Orange Texas


## Air Conditioning Committee To Embrace Residential Field

RECOGNIZING the growing importance of gas-fired summer air conditioning to the industry, the Industrial and Commercial Air Conditioning Committee of the Industrial Gas Section of the A.G.A. has changed its designation to the Joint Committee on Summer Air Conditioning of the Industrial and Commercial Sections.

The action was taken in an all-day meeting held in A.G.A. headquarters, New York, on December 4, at which 17 members were present. As a result, activity in the furtherance of gas-fired air conditioning, which has hitherto been confined to commercial and industrial installations, will embrace the residential field as well.

The suggested 1940 gas air conditioning sales plan as presented in the 1939 committee report was adopted substantially as the committee recommended it.

Cooperating with the American Society of Heating and Ventilating Engineers, the committee will conduct a joint research at the research residence of the University of Illinois on the subject of comfort requirements at low relative humidities.

■ ■

## State Fuel Supply Rebuilds Beaver River Crossing

Taking advantage of the low water stage of the Beaver river, known as the North Canadian further downstream, the State Fuel Supply Co., Oklahoma City, Okla., completed, November 16, at a cost of about $5000, reconstruction of its river crossing over that stream east of Laverne, Okla.

About 7500 ft., of 4-in. steel, welded gas pipe line were laid about one-half mile upstream from the old river crossing. The latter was left in place during the 30 days required for the new construction, in order to prevent interruption of service, according to Earl Fox of the company.

The North Canadian river sometimes is subjected to sudden and rapid rises. These had undermined a part of the old river crossing line near one bank. The new river crossing is anchored by three river clamps.

■ ■

## Gas Heated Homes Shown In Sales Brochure

In order to convince prospective customers they can afford to use natural gas for heating purposes, salesmen of the Southern Union Gas Co. system are showing heating prospects a brochure made up of photographs of homes in their own territories which are already equipped with gas for heating, together with an analysis of gas service costs for the length of time the equipment has been installed. The pamphlets are printed by the company's printing department.

This sales idea was developed by L. L. Baxter, district manager of the Southern Union Gas Co. at Fayetteville, Ark.

■ ■

## Natural Gas Fuels Cement, Okla., Oil Development

The State Fuel Supply Co., Oklahoma City, Okla., has been furnishing natural gas as fuel for the drilling of 12 oil and gas wells on the townsite of Cement, Okla. Nine of these had been completed up to Dec. 12. The wells were sunk to an average depth of 3200 ft.

Earl Fox, of the State Fuel Supply Co., reports that four of the wells, which have been completed, were drilled by a contractor using steam installations. Approximately 27 million cu. ft. of gas were used in the drilling of these four wells, according to Mr. Fox.

Another drilling contractor has completed three wells using gas engine installations of 350 hp., which used a total of approximately two million cu. ft. of gas, according to Mr. Fox.

Since the Cement townsite wells were brought in the State Fuel Supply Co. has installed a 50-hp. gas engine to pump oil to the refinery at Cyril, Okla.

■ ■

## A. E. Merchant, Executive, Passes Away in New Orleans

Arthur E. Merchant, general superintendent of the gas department of New Orleans Public Service, Inc., died suddenly Dec. 6 at his home in New Orleans. He was 57 years old, a native of Tourqay, England, and had been identified with the New Orleans gas industry since 1917.

A. E. MERCHANT

Mr. Merchant was president of the Southern Gas Association in 1927 and was a member of the American Gas Association at the time of his death. He was one of the first men in the industry to experiment with the odorization of natural gas and has long been active in the gas manufacturing and distribution fields.

■ ■

## Texas Cities Gas Co.'s New Home Ready Soon

The Texas Cities Gas Co. expects to move into its new Galveston office building about the middle of this month, according to Paul E. Nicholls, general manager. The building is of steel, concrete and brick construction, one story in height, but occupying four city lots. It will be gas-air-conditioned with special equipment that will heat the building in winter, cool it in summer, and supply lights all of the time.

The total cost of the building will be approximately $55,000, to which some $20,000 in furnishings and equipment will be added.

■ ■

## Stove Round-Up in Wisconsin Ends With Quotas Exceeded

With a total of 302 gas range sales made in Oshkosh, Green Bay, Sheboygan, and several smaller communities, the Wisconsin Public Service Corp. closed its fourth annual Old Stove Round-Up campaign the last of November. Nearly one-third of the sales made in Sheboygan were for CP ranges, and this division outsold its quota by 30 ranges.

Arvin Olson, Sheboygan salesman, received the national CP Ranger recognition with his sales of 14 CP models and 18 conventionals.

■ ■

## James J. Norton Dies

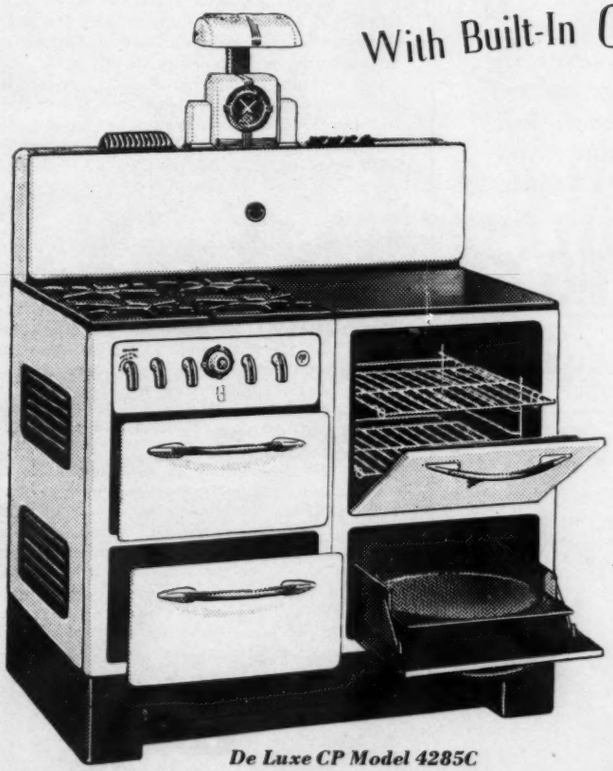
James J. Norton, senior assistant in the tax department of Consolidated Edison Co. of New York, Inc., died December 11 at his home in New York. Mr. Norton had served the company nearly 45 years, starting as office boy in 1895. During almost all of his business career he was concerned with the accounting and auditing aspects of the utility business.

# *New* DISTINCTIVE

# ★ WEDGEWOOD ★

## *Gas Ranges*

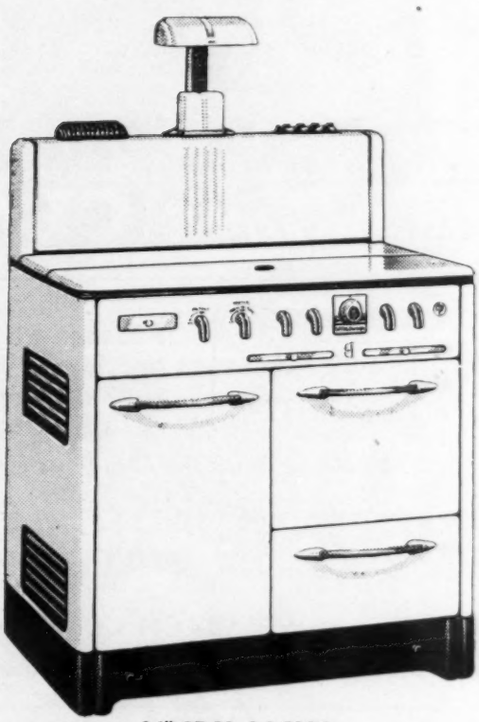
## With Built-In GAS CIRCULATING HEATER



*De Luxe CP Model 4285C*

**WITH HIGH SPEED - LOW TEMPERATURE OVEN**
Instant, cheering warmth is the keynote of this lovely new De Luxe Wedgewood Range. The Built-in Gas Circulating Heater lights itself at the simple turn of the valve. Kitchen and breakfast room are heated quickly and economically.

**FEATURES . . . FOR EFFICIENCY AND ECONOMY**
• Three standard Speed-Plus-Simmer Burners. • One Giant Speed-Plus-Simmer Burner. • Astogril Rotor-Disc Broiler. • Oven Heat Control. • Stop-Catch Flat Bar Oven Racks. • Removable Oven Side Brackets. • Sectional Speed Top. • High-Speed, Low-Temperature Oven. • All Burners Self-Lighting.



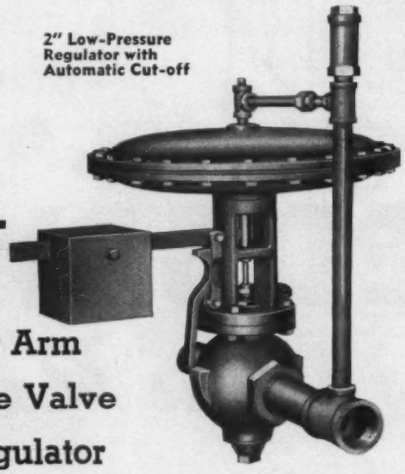
*36" CP Model 5285*

**WITH TOP GRIDDLE AND WARMER**
This delightful Wedgewood Gas Range strikes a new tempo in efficiency, economy and beauty. Built-in Gas Circulating Heater is self-lighting and provides instant, clean, healthful warmth at low fuel cost.

**Wedgewood Ranges Are Adapted for All Types of Gas Including Bottled Gas**

Gas THE MODERN FUEL

**ALWAYS WEDGEWOOD QUALITY—MAKES FRIENDS FOR GAS**
JAMES GRAHAM MANUFACTURING CO. • LOS ANGELES • SAN FRANCISCO • NEWARK, CALIF. • PORTLAND, ORE.




EASY—

- to Position Lever Arm
- to Remove Inside Valve
- to Dismantle Regulator

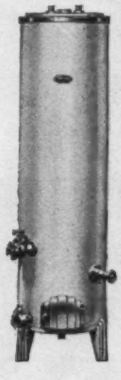
All C-F Low-Pressure and Medium-Pressure Regulators are built with flanged upright bolted on, for easy detachment and renewal of valve seats. This important convenience, long familiar to users of larger-size C-F equipment, is now standard on C-F Regulators of whatever size. Ask for new Catalog.

The CHAPLIN-FULTON MFG. CO.

28-40 PENN AVE. CF PITTSBURGH, PA.

- EFFICIENCY
- ECONOMY
- DURABILITY
- RELIABILITY

Reasons why Hotzones are favorites year after year.



*The Heater With the Luminous Flame Burner*

HOTZONE Welsbach AUTOMATIC GAS WATER HEATERS

WELSBACH COMPANY

Gloucester City, N. J. — *Branches* — Chicago, San Francisco

GAS—810 South Spring Street, Los Angeles, California

Yes! SEND ME GAS

*for* ☐ 3 Years at $2.00

SUBSCRIPTION RATES: United States, Canada, Mexico and Central American countries (in advance), three years $2.00; all other countries, $3.00 per year.

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## New Ohio Wells Produce Large Quantities of Gas

SEVERAL large gas wells have been drilled recently in Ohio by gas and drilling companies. In Noble County, the Yoker Valley Gas Co. has brought in its seventh and eighth wells, which produce 1,590,000 and 4,000,000 cu. ft. daily. The entire daily supply of gas produced by this company is being used by the Ohio Fuel Gas Co., Columbus, Ohio. In the same county the Wool Rocks Oil and Gas Co. has produced a 200,000 cu. ft. gas well.

The Beaver Oil and Gas Co., Harry G. Clymer of Dexter City, driller, has drilled a 3,000,000 cu. ft. well in Beaver Township, making its second large well on the same farm. Near Williamstown, W. Va., O. J. Gabbert and N. B. Biddle of Williamstown have drilled a small well producing about 200,000 cu. ft.

The Corning Producing Co., drilling in the new field near Corning, brought in a well producing an estimated 1,250,000 cu. ft. The Ohio Fuel Gas Co., Columbus, and Davis & Hazlett of New Lexington have also brought in producing wells recently in this area.

According to John A. Kuhn, Pittsburgh representative of a group of New York and Pittsburgh oil men, there may be gas and oil in Champaign County. The group has leased 5000 acres of land for possible oil development.

■ ■

## Power Commission Amends Rules For Gas Exportation

The Federal Power Commission has recently amended its rules for the issuance of permits for the construction of facilities for the exportation and importation of natural gas. The new ruling requires that the applicant give information relative to ownership and corporate set-up, a general or key map showing physical location and giving a full description of facilities, a statement describing every existing contract that applicant has filed with a foreign government or private concern, and copies of every landing license or permit which has been granted applicant by a foreign government.

The Power Commission was authorized in July, 1939, to issue permits for the construction of pipe lines for the exportation and importation of natural gas.

■ ■

## New Gas Pool Found in Main Cut Bank Field

A new gas pool in the west Cut Bank field district, Montana, was opened early in December by the Glacier Production Co. The pool is on the northern end of the main field.

The well encountered a flow of 31,000,000 cu. ft. of gas per day at 2910-14 ft. Operators endeavored to kill the flow so that the well can be drilled ahead. The gas came as a surprise as the well is considered to be too far west for gas production.

■ ■

## Clayco Gas Builds Plant

In West Virginia the Clayco Gas Co. has built a Girbotol plant for removing hydrogen sulphide from 15,000,000 cu. ft. of gas per day. Construction of this plant, which is located near Charleston, was by J. F. Pritchard & Co. of Kansas City. Another West Virginia installation is at Sissonville where the 15,000,000 cu. ft. capacity plant of the United Fuel Gas Co., which was built last May, has been enlarged to bring the capacity up to 40,000,000 ft.

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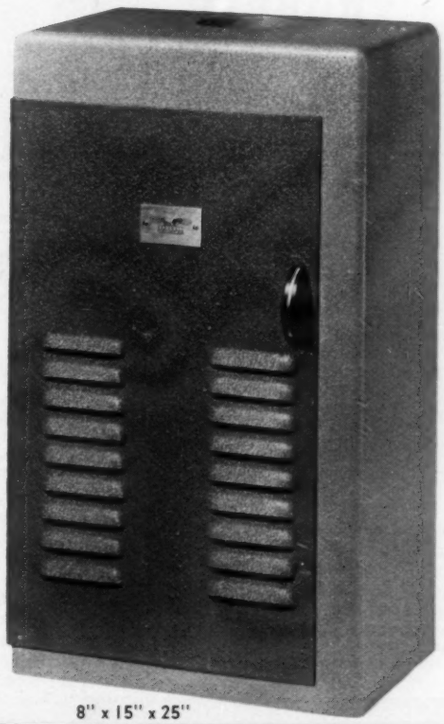

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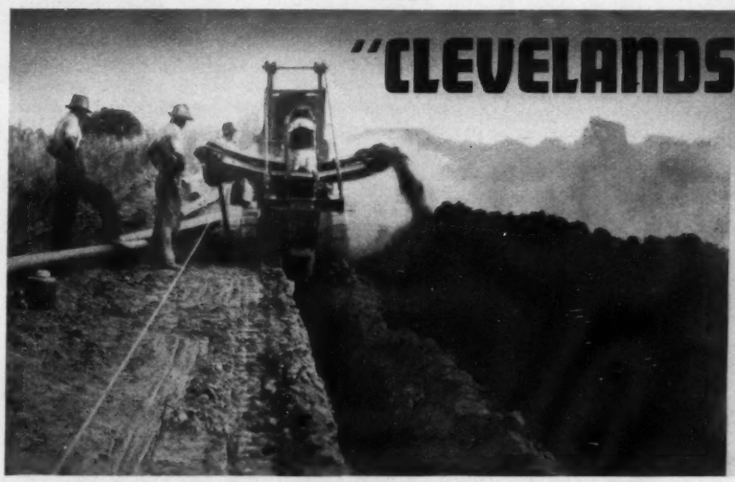

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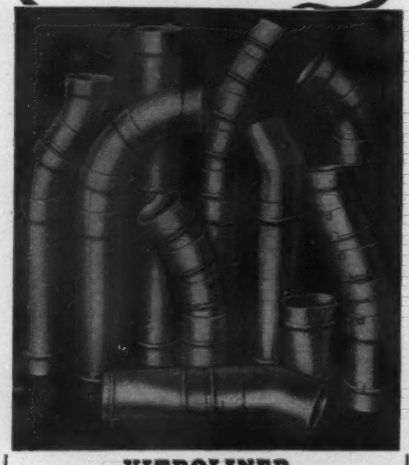

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# CURRENT Reading

**Employers' Digest of the Fair Labor Standards Act of 1938,** six-page folder issued by the Wages and Hours Division, U. S. Department of Labor, Washington, D. C.—Describes, in simple language, the most important provisions of the wage-hour law, and gives understandable definitions of the various parts of the Act. Particular stress laid on calculation of overtime pay and record-keeping requirements. Topics covered are: coverage, wages, hours, records, penalties, child labor, and exemptions. Copies are free to all employers, at Washington, or from any district office of the Wages and Hours Division.

**What Will Social Security Mean to You?**—Bion H. Francis; 85 pages, paper; published by American Institute for Economic Research, 54 Dunster St., Cambridge, Mass.; $1.00—An interpretation and clarification of the social security act, with particular reference to the 1939 amendments to the Act. Mr. Francis appraises the effect of the law on employers, employes, and the general public, and indicates what he believes are serious defects. Specific examples show how anyone can compute for himself or his family the future benefits and the effects of these benefits on his own insurance and retirement program. Separate chapters are devoted to the important sections of the Act: old-age pension, insurance, unemployment insurance, public health and assistance. Effects of the Act on various types of business enterprises, and on all business, are reviewed.

**Soil-Corrosion Studies, 1937. Corrosion-Resistant Materials and Special Tests**—Kirk H. Logan. *Journal of Research,* Oct., 1939, pp. 515-542. The soil-corrosion investigation begun in 1922 showed that many soils cause rapid corrosion of the commonly used pipe materials. The manufacturers of pipe have tried to develop materials more resistant to corrosion. In 1932 some of these materials were buried in 15 corrosive soils for the purpose of determining their resistance to soil corrosion. Specimens are being removed at intervals of two or more years. The second group of specimens, including 41 metals and alloys and 11 protective coatings, was removed in 1937, and the results of their examination are contained in this paper. The results of several special tests are also given.

**Release of Gas From Capillary Tubes and Other Natural Gas Problems**—George Lloyd Mann, B.S., Ch.E., West Virginia University. The experimental work presented in this paper has dealt with various problems pertaining to the natural gas industry. Part I has dealt with a study of the fundamental laws governing the release of gas from capillary tubes. In this work a series of experiments were conducted on the escape of various gases from varying lengths of small tubes. A mathematical equation describing the pressure distribution throughout the tube was developed.

In part II, combusion studies were made on several problems pertaining to diffusion flames. This type of burner consists essentially of two concentric tubes or pipes. The combustible gas passes upward in the inner tube simultaneously with the upward passage of air in the outer tube. The combustible gas is ignited and burns at the tip of the burner as a non-flickering luminous flame.

**Measurement of Water Vapor Content of Gas by Conductivity of Sorption Films**—School of Mineral Industries, A. W. Gauger, Director, and F. C. Todd, Assistant Professor, Petroleum and Natural Gas Engineering. (A preliminary report). Pennsylvania State College. The conclusion was reached that, while the conductivity of sorbed films may be used to measure humidity and while applications exist where it may be a desirable method, the corrections involved and the time required for a reading do not recommend it as a precision method for measurement of water vapor content of gaseous fuels.

**New Type Burners Speed Combustion, Provide Higher Heat Release**—Edwin L. Dennis. *National Petroleum News,* Nov. 1, 1939, pp. R466-468. A trend in design of burners toward the "short flame" type has resulted from recognition that most satisfactory furnace conditions are secured from the burner completing combustion most rapidly. Increased combustion speeds results in higher heat releases than where secondary combustion takes place, and its disadvantages are eliminated. Among a number of burners developed is a fanmix type employing new principles of operation. It mixes the gas with the air essentially in the plane of rotation of a fan which is propelled by gas streams emitting from orifices in revolving spokes mounted between the fan blades on the same hub. These burners are designs individually made to suit the B.t.u. value of the gas, the gas pressure, and the service required. Fanmix oil burners are propelled by steam.

**The Freezing of Natural Gas Regulators**—W. C. Mitchell, Sylvan Cromer, R. L. Huntington, the University of Oklahoma, Norman, Okla. The temperature drop in a gas regulator was greatest at the valve ports, the lowest temperature being observed at the lowest port. The magnitude of the temperature drop occurring in the regulator was not as great as that obtained in the choke apparatus. Although the temperature drop due to velocity was the governing factor in the choke apparatus, the Joule-Thomson effect appeared to be the predominant factor in the regulator tests.

**Cathodic Protection and Polarization of Underground Pipe Lines**—Robert J. Kuhn. *Oil and Gas Journal,* Sept. 21, 1939, pp. 98, 102, 127. A presentation of the basic theory underlying the idea that underground metallic pipe lines are acting as huge batteries, resulting in polarization, and that cathodic protection is a means to combat corrosive effects of this condition.

**Submarine Pipe Line for Union Oil Co., Monterey Bay, Calif.**—Fritz Karge. *Oil and Gas Journal*, Sept. 21, 1939, pp. 104, 106, 110. Description of the wrapping and cathodic protection of this line.

**Recent Progress in Natural Gas Transmission**—Robert W. Hendee. *Oil and Gas Journal*, Sept. 21, 1939, pp. 123, 127, 128. Some of the discoveries made and new ideas and operations applied which have made for progress discussed in this article are the dehydration and combination dehydration and desulfurization plants which resulted from the discovery of hydrates in pipe lines, electrolysis and cathodic protection, metallizing applied to repair work, wash and flood control along pipe line rights-of-way, thin wall pipe made from higher tensile strength steel, and smaller high-speed engines and compressors.

**Method for Applying Thick Asphalt-Mastic Pipe Coating**—W. W. Colley. *Oil and Gas Journal*, Sept. 21, 1939, pp. 150, 152. A method for the fast application of dense asphalt-mastic protective coating to an operating pipe line has been developed by Industrial Engineering Co., Wilmington, Calif.

**Improvements in Pipe Line Welding Practices**—W. Mike Murphy. *Oil and Gas Journal*, Sept. 21, 1939, pp. 180, 210. Since the origin of welded construction of steel pipe lines, its engineering has developed rapidly but without sudden or revolutionary changes. Improvements have resulted from production of higher strength welding materials adaptable to practical field welding methods, provision of portable weld testing equipment, design of mechanical pipe handling tools, and evolution from experience of efficient construction organization.

**Vapor-Phase Cooling for Internal-Combustion Engines**—J. H. Wallace and R. A. Newton. *Oil and Gas Journal*, Sept. 7, 1939, pp. 58, 63, 64, 66, 67, 106. High temperature cooling equipment, utilizing the water vapor of engine cooling system to effect the exchange, is described by the authors, and the advantages and disadvantages of the system.

**A Colorimetric Method for Determining Water Vapor in Technical Fuel Gases**—E. Kenneth Schluntz, Fellow of the Graduate School, Department of Petroleum and Natural Gas Engineering, the Pennsylvania State College. The method of determining moisture in fuel gas based on the photoelectric change of color of a solution of $CoCl_2$ in n-butyl alcohol as water is added to it offers promise as an accurate and convenient method available for fuel gases in general.

**The Mixing of Gases in Porous Media**—Richard Ducker and R. L. Huntington, Chemical Engineering School, University of Oklahoma, Normal, Okla. It is the hope of the authors that this attempt to throw some light on the nature of gas mixing and dilution in porous media will serve as a stimulus for other investigators to make further progress in the study of this phase of the flow of fluids.

**Benzene (Benzol) Poisoning**—Five papers reprinted from the *Journal of Industrial Hygiene and Toxicology:* Chronic Exposure to Benzene, I. The Industrial Aspects, by Manfred Bowditch and Hervey B. Elkins, II. The Clinical Effects, by Francis T. Hunter, III. The Pathologic Results, by Tracy B. Mallory, Edward A. Gall and William J. Brickley; Benzene (Benzol) Poisoning in the Rotogravure Printing Industry in New York City, by Leonard Greenburg, May R. Mayers, Leonard Goldwater and Adelaide R. Smith; The Hematological Effects of Benzene (Benzol) Poisoning, by Lowell A. Erf and C. P. Rhoads.

**Method of Designing Charts for Determining Compressor Capacities**—G. H. McKay. *Petroleum Engineer*, Nov., 1939, pp. 54, 36, 37, 40. When a system is comprised of compressors of various sizes, a ready method of determining capacity is essential during peak loads. Such a system is described.

**Cooperative Problems Involved in Cathodic Protection**—L. F. Scherer. *Oil and Gas Journal*, Nov. 17, 1939, pp. 179, 181, 183, 184, 186. This paper is a summation of the early history of cathodic protection in its application to the pipe line industry. The organization of the Mid-Continent Cathodic Protection Association—together with its aims, purposes, accomplishments, and limitations—is discussed in some detail. Data presented show the details of the application of this form of protection to the petroleum industry, and indicate clearly its rapid growth within the past few years. A. P. I. paper, Chicago, Nov., 1939. Also in *Oil Weekly*, Nov. 27, 1939.

**High Pressure Pipe Welding Joints—A Review and a New Development**—H. N. Boetcher. *Heating, Piping and Air Conditioning*, Nov., 1939, pp. 678-680. With improved equipment and technique, and rigid qualification tests, joint design for welded power piping installations has assumed increasing importance. A discussion of designs involving separate backing rings, and the development of a new design being used for the high and intermediate pressure piping for a specific application is given.

**Apparatus for Taking an Average Sample of a Variable Flow of Gas**—A. Blackie. *Journal Society Chemical Industries*, Trans., Sept. 1939, pp. 293-296. A method for obtaining an average sample of a gas flowing in a pipe is described. By this method the influence of variations of gas velocity, pressure, density, and temperature which affect the accuracy of most sampling methods may be eliminated. Two forms of apparatus are described, one for small samples and one for larger ones, and means for meeting some of the practical difficulties are suggested.

**Indicating Pressure and Vacuum Gages, Round, Dial Type with Elastic Pressure Chamber Standard**—ASA B40.1-1939. Approved by American Standards Association, July, 1939.

**American Society for Testing Materials Standards on Petroleum Products and Lubricants**—Prepared by Committee D-2, 1939 edition.

**Recirculation of Boiler Water to Hot Process Softeners**—John J. Maguire and W. J. Tomlinson. *Combustion*, Sept. 1939, pp. 26-32. In the June, 1939, issue S. M. Sperry discussed the recirculation of from 1 to 2 per cent of the boiler water to correct the hydrogen ion concentration of the feedwater for the protection of economizers, feed pumps and feed piping. The present authors discuss several additional ways in which advantage can be secured by boiler water recirculation.

**Hold it There**

Here is the new General Controls Gas Fuel Governor. It is designed for commercial and light industrial use and will throttle gas lines according to the boiler pressure applied on the diaphragm. The best of materials and design features are incorporated into this control. It is suitable for natural, manufactured or butane gas. The diaphragm of the governor has a minimum of movement to increase the sensitiveness of control.

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To provide the high lift necessary to maximum capacity flow, a lever-action to multiply the stem movement is incorporated into the valve. The valve stem of the fuel governor is of ground and lapped stainless steel. It incorporates a swivel and disconnect to facilitate the replacement, if necessary, of the valve stem seal which is of molded design—no packing.

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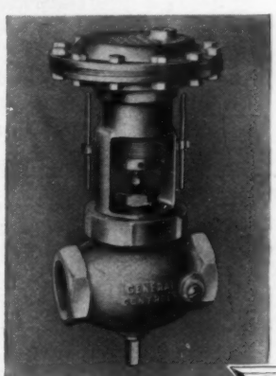

GENERAL CONTROLS
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# Hutchinson Gas Club Holds Regular Christmas Meeting

THE Hutchinson Gas Club, newly named in honor of its organizer, met for its regular Christmas luncheon in New York on December 4, as guests of F. L. Fairchild, president of the Sprague Meter Co. It was on December 3, 1931, that William P. Hutchinson first assembled a small group of gas engineers having offices in downtown Manhattan and vicinity to sit with him at a small informal holiday luncheon.

Many who attended that day were strangers to each other, and out of this meeting they formed a group that agreed to meet once a month so that they might become better acquainted. During the years that followed some members of the group never failed their monthly luncheon with "Hutch," and he in turn always played host at Christmas time. In May 1939 "Hutch" passed on; but his Christmas luncheon was held as usual, and he who had once played host moved on to be memory's guest of honor.

Of the original group that met in 1931, five members were present in 1939—C. R. Bellamy, L. O. Gordon, Ross Holmes, S. P. Cobb, and Alan Lockwood, who this year served as informal chairman.

Walter C. Beckjord, president of the American Gas Association, spoke briefly, paying first a tribute to Mr. Hutchinson, as his personal friend, and following with observations on the promising possibilities that lie ahead of the gas industry for 1940. C. R. Bellamy spoke, and answered many questions regarding the new market for gas fired summer air conditioning equipment.

■ ■

## Lordsburg, N. M., Expands Municipal Gas System

The City of Lordsburg, New Mexico, has recently added 1½ mi. of 2-in. mains to its two-year-old natural gas system, thereby gaining 37 new and potential users of gas. On January 1 it was estimated by Superintendent S. H. Gass that there were approximately 400 consumers in Lordsburg. El Paso (Texas) Natural Gas Co. furnishes the gas to the city.


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Cleveland trencher at work in Centerville, Texas, which last month took natural gas service from Lone Star Gas Co.'s new 50-mile transmission line between the Buffalo Field and Bryan.

## Three Towns Take Service From New Lone Star Line

THE towns of Centerville, Normangee and Leona, located on the 50-mile 8-in. gas transmission line of Lone Star Gas Co., completed from the Buffalo gas field to Bryan, Texas, were placed on gas service by Community Natural Gas Co., affiliated company, in December.

The distribution system at Centerville was completed during the week of December 17. Normangee was completed a week later and Leona was scheduled for completion the week of the 27th. Madisonville, the fourth town to be piped, will go in service this month.

The main line passes directly by the towns of Normangee and Centerville. Leona is one and three quarters miles from the line, and Madisonville is approximately 13 miles removed. The tap line to Leona is 2-in. in diameter and that to Madisonville is 3-in. in diameter. All street mains and tap lines are of welded steel pipe with welded joints. The system will be operated at intermediate pressures under a pressure of 2 lbs. to the sq. in.

All unskilled labor required on the project was hired locally. The construction work was handled by Community Natural Gas Co., with H. D. Portwood, chief engineer of the company, in charge. The system will be operated by the Bryan district of the Waco division of Community Natural.

■ ■

## Gas Water Heater Campaign Will "Kick Out the Kettle"

Water heater dealers in Texas, Mississippi and Louisiana will cooperate with the United Gas Corp., of Houston, Texas, in a new sales campaign on gas water heaters that will be signalized for the second time by the slogan that "it's kick out the kettle" time again.

The campaign opened on Dec. 26 and closes Feb. 24. Last year a similar drive resulted in sales of 35 carloads of gas water heaters, 2487 heaters, with three-fourths of the sales made by dealers.

■ ■

## New Haven Accountant Dies

Ida M. Kessel, for 29 years connected with the New Haven (Conn.) Gas Light Co., died November 6, 1939. Miss Kessell was first employed as a bookkeeper in the commercial department, and later was transferred to the position of teller in the cashier's department.

# . . . and how do YOU feel about 1940

AT the beginning of every New Year, you hear this question up and down a thousand Main Streets. Business men trade opinions, hoping to find out what the other fellow is thinking and what commitments he is planning to make. This year, with a war in Europe and another in the Orient, there's an even greater amount of speculation.

Occasionally one encounters a long face and a prediction of calamity. But any survey of conditions generally throughout the nation should lead one to believe that, war or no war, business conditions are improving, and should continue to improve for the next two quarters, at least.

One reason is that appliance sales have been going up and there is a certain momentum behind any such increase.

Also, we observe a "go ahead" attitude in other quarters. For example, the replies to Colonel Leonard Ayres annual questionnaire showed an overwhelming opinion that business is getting better. Out of 500 top-flight business leaders who were asked whether they expected and were planning for an increase in sales, 456 replied emphatically "yes."

Another factor is that most market indices are up. As this is written, electric power production has just reached an all-time high. Automobile production is up. Steel production is up. Carloadings are up. The composite Associated Press index for last month showed the greatest activity since November, 1929.

Still another factor is the marked upswing in farm commodity prices. Even our California growers who were expected to be hard hit by the curtailment in overseas purchases are not doing nearly as badly as was feared.

Finally, there is the attitude of appliance manufacturers, based partly on factors already mentioned and partly on indices peculiar to their own business. According to local distributors who have recently returned from their annual home-office conferences, the appliance industry is gearing itself for a 10 to 15 percent increase between now and June.

Of course all these factors apply to the general market situation and everyone who reads the papers knows about them. So keep in mind that while people have more money, or at least are showing an increasing desire to spend their money, other industries are just as aware of the fact as we are and just as determined to do something about it.

For our part, we can do nothing better than face the facts squarely, recognize that more business is in sight for those who will go after it—and then go after it! Optimism won't get us anywhere until we translate that optimism into action.

Let's remember, too, that we have machinery set up in the Gas Appliance Society for *collective* action, and that by collective action we have "made our breaks" on more than one occasion, and in far less promising times than these.

Let us all who lead the industry keep on at the job of educating the smaller dealers to plan their work and work their plans. Let us show them by example that setting up a quota and laying out a careful plan of attack is far better and more profitable than sporadic, hit-or-miss merchandising.

And above all, let us show them what is meant by "follow through."

**P·G·and E·**

PACIFIC GAS AND ELECTRIC COMPANY

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# INDUSTRY *Personalities*

**Charles Y. Freeman** was elected chairman of the Public Service Co. of Northern Illinois and of the Commonwealth Edison Co., Chicago, at meetings of the Boards of Directors of these two organizations on December 1. He fills the offices left vacant by the death of James Simpson.

Since 1932, Mr. Freeman has devoted his time to legal and corporate matters affecting the Edison group of companies. For the past two years, as general counsel of the two companies, he has been actively engaged in assisting Mr. Simpson.

Mr. Freeman was born at Lockport, N. Y., on March 29, 1877. He was graduated from Princeton University, and received his law degree at Northwestern University. He was admitted to the bar in 1902.

Commissioner **Leland Olds,** of New York, has been elected chairman of the Federal Power Commission, effective January 1, 1940. His election is for the remainder of his term of office, which extends to June 22, 1944. He succeeds Commissioner **Clyde L. Seavey,** of California, who has been head of the Commission since October 1, 1937.

Before his appointment to the Federal Power Commission last June, Mr. Olds was for a number of years executive secretary of the Power Authority of the State of New York.

For 10 years he has been closely associated with public utility development and legislation. In 1929 he became economic adviser in connection with the Commission on Revision of the Public Service Laws in New York State, instituted under Governor Roosevelt, and was later special adviser to the Governor on utility legislation. When the New York State Power Authority was created, Mr. Olds became head of the staff, and was its executive secretary. In 1936 he was a member of the commission which made a study in various countries of the operation of cooperatives and in 1937 made to President Roosevelt its report of the "Inquiry on Cooperative Enterprise in Europe."

Commissioner **Claude L. Draper,** of Wyoming, has been reelected vice chairman of the Commission for the calendar year 1940. The senior member of the Commission in point of service, Mr. Draper is the only one remaining of the Commissioners appointed by President Hoover when the Commission was reconstituted, in 1930.

**H. C. Beaver,** president of Worthington Pump and Machinery Corp., Harrison, N. J., has announced the election of **Maynard D. Church** as vice president, and **R. W. Towne** as assistant secretary. Mr. Church is also president of Worthington's subsidiary company, the Moore Steam Turbine Corp. Mr. Towne, a graduate of Cornell University, has also been connected with the Moore company.

**Norman B. Bertolette,** president and general manager of the Hartford (Conn.) Gas Co., was recently elected president of the Hartford Chamber of Commerce.

For the second time, **Rudolph Kasper,** employe of the gas department of the South Carolina Power Co., Charleston, S. C., has been awarded the McCarter medal and certificate for saving a life by the Schafer prone pressure method of resuscitation. Mr. Kasper was previously awarded the medal in 1928.

**Frank L. Pringle,** executive vice president and general manager of the West Ohio Gas Co., Lima, was recently reappointed at a company reorganization meeting. Other officers elected are **George S. Vail,** president and treasurer; **H. O. Bentley,** secretary and general counsel; and **H. S. Knight,** assistant secretary and assistant treasurer.

**P. B. McBride** of the Porcelain Metals Corp., Louisville, Ky., was elected president of the Porcelain Enamel Institute for 1940 at the organization's ninth annual meeting in New York City November 16 and 17.

**W. A. Tabb** has been appointed chief engineer of the United Gas Pipe Line Co.'s Latex, La., compressor station, replacing **M. V. Cousins,** who has been promoted to personnel director. Mr. Tabb was formerly first engineer at the Magasco station, Texas. In his new position he will also supervise the Bethany, La., and Waskom, Texas, stations.

Replacing Mr. Tabb at Magasco is **W. W. Kirkpatrick,** formerly first engineer at the Latex station. Mr. Kirkpatrick has been at Latex since 1933.

**C. C. Winterstein,** manager, Appliance Laboratory, The United Gas Improvement Co., has been appointed chairman of the A.G.A. Laboratories' Subcommittee on Approval and Listing Requirements Correlation which recently held its first meeting at the Cleveland laboratory. Active in gas utilization over a 30-year period, Mr. Winterstein has been in close contact with needs of the industry for a standardization program. Since the establishment of the A.G.A. Testing Laboratories, he has been active in the formulation of requirements for gas appliances and accessories.

**Lloyd L. Garner,** manager of the Gas Service Co., Independence, Mo., who was seriously injured in an automobile accident last fall near Fort Scott, Kan., is recovering rapidly at the St. Joseph's hospital in Kansas City. It was expected that he will soon be able to leave the hospital.

**R. S. Wallace,** president of the Central Illinois Light Co., Peoria, Ill., was honored on Dec. 1 by a testimonial meeting celebrating 40 years of continuous service with

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Mueller Gas Era Furnaces Out-Perform Them All.
Sell Mueller, the Hottest Name in Heating.

L. J. MUELLER
FURNACE COMPANY
MILWAUKEE

the company. W. H. Barthold presented him with the 40-year service button and Dr. George Mitchell gave him the testimonial sheepskin parchment scroll of esteem, signed by directors, officers, division managers and superintendents.

**Carl M. Stephens** has been appointed manager of the Council Bluffs, Iowa, office of the Council Bluffs Gas Co., according to R. M. Redding, vice president in charge of operations. He succeeds **H. C. Holder. Louis W. Jacob** has been made superintendent of plant operations.

**Claude R. Page** has been named assistant foreman of the Lone Star Gas Co. shop in Dallas, Texas, by B. L. Rogers, superintendent of compressor stations.

**William T. Rasch** has announced his resignation as president of American Gas Products Division, American Radiator and Standard Sanitary Corp., New York City, to become president of the Security Stove and Manufacturing Co., Kansas City, Mo. Mr. Rasch, a former president of the Association of Gas Appliance and Equipment Manufacturers, had been with the American Radiator Co. 15 years. He will take over his new duties in Kansas City around January 15, although the appointment was effective January 1.

W. T. RASCH

The Security Stove Co. plans to expand into the national market, having previously distributed its heating and hot water appliances locally.

**C. H. Coffman,** formerly in Dallas (Texas) Gas Co.'s street department, has recently joined the staff of the inspection and maintenance department, Lone Star Gas Co.

**Alice H. Mangan,** selling appliances on the floor of the Brooklyn branch office of the Brooklyn Union Gas Co., has been awarded the title of the first woman Star Ranger in America as a result of selling 50 CP gas ranges during 1939, according to an announcement in the *Brooklyn Union Gas News.*

Whitehead Metal Products Co., Inc., announces the appointment of **Ralph L. Bailey** as Pacific Coast manager, replacing J. J. Whitehead, Jr., resigned.

**Ed R. Colvin** completed 20 years of continuous service with the San Diego Consolidated Gas & Electric Corp. last November. This did not include seven years of service prior to 1919, interrupted by a period away from the company. Another 20-year man with the company is **Leo Sekloca,** who is in the gas distribution department.

**William J. Layland,** for nine years superintendent of The Gas Service Co. at Carrollton, Mo., has been transferred to Falls City, Neb., where he will act in the same capacity, exchanging places with **Michael Connor.**

**Galen Chitwood,** with The Gas Service Co., of Kansas City, since 1925, has been appointed manager of the company's Webb City, Mo., property, replacing the late Charles O'Neill, who passed away on Nov. 1.

# Noiseless Control for Heaters

If you want a gas valve that won't hum, stick or chatter, use a KLIXON disc-operated electric gas valve. Being thermally operated, a Klixon Gas Valve gives you none of the troubles common to solenoid valves — yet it is positive, accurate in its control and easily connected to any type of gas heater. Sizes range from 3/8" to 1 1/4" I. P. S. through 1000 cu. ft.

Sold separately or in packaged sets complete with the newest Klixon snap-acting room thermostat.

Write for complete details.

KLIXON

*Spencer Thermostat Co.* Attleboro Mass.
Canadian Distributors:
Cansfield Electrical Works, Toronto, Canada

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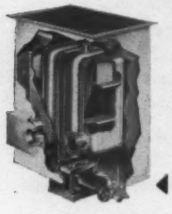
SELLS
GAS!

When you sell a Payne Furnace you sign up a satisfied gas consumer for life! A quarter of a century devoted exclusively to precision construction and engineered design of gas fired appliances means carefree heating for the user, a *permanent gas load for you.*



◀ The Payne Floor Furnace

There is a Payne Gas Furnace for every heating need

FLOOR FURNACES • FORCED AIR UNITS
CONSOLES • WINTER AIR CONDITIONERS
DUPLEX FURNACES • GRAVITY FURNACES

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COMBINATION GAS CONTROL
*Provides*
COMPLETE SAFETY
FOR ALL FUEL GASES

*For Additional Information Write*
MILWAUKEE GAS SPECIALTY COMPANY
MILWAUKEE - WISCONSIN

**George D. Watrous,** director of the New Haven (Conn.) Gas Light Co., was honored recently by fellow directors upon his completion of 50 years of service as a director of the company. He has also been a vice president since 1911. Mr. Watrous is a graduate of Yale University, and a member of the law firm of Watrous, Hewitt, Gumbart & Corbin.

**James W. Moore,** manager of the department of research and engineering sales, American Cast Iron Pipe Co., Birmingham, Ala., has been accompanying the company's "display bus" on its tour of mid-continent and western gas fields. The bus is a traveling exhibit equipped with samples of Mono-Cast Centrifugal pipe, fittings, joints and accessories, and has been shown to more than 12,000 visitors. It has traveled over 35,000 miles since it started on the road in June, 1938. The bus will soon reach the West Coast, where it will be accompanied by a crew of technical men trained in the gas industry.

B. Sonntag, president of The Vent-A-Hood Co. of Dallas, has announced the appointment of several new factory representatives covering the trade territories of Chicago, Pittsburgh, St. Louis and Kansas City. The men appointed are **Royal A. Stemm,** 21 East Van Buren, Chicago; **T. C. Kersey,** 2347 Manor Ave., Pittsburgh; **Russell Patton,** 526 Vanderventer, St. Louis; and **Ross Calkins,** 1015 Mulberry, Kansas City.

**Roger J. Whiteford,** Washington, D. C., attorney, has been elected president of the Associated Gas and Electric Co., of Ithaca, N. Y., succeeding **J. I. Mange,** who resigned because of ill health. The Associated Gas and Electric Co., a power holding concern, is preparing to reorganize its management to conform to provisions of the Public Utility Holding Company Act, which calls for integration of utility systems both geographically and economically.

**Ralph F. Gibson,** who has been manager for the Van Wert, Ohio, division of the Associated Gas and Electric Co., has been appointed to the management of the gas division of the Wilmington, N. C., office of the Tide Water Power Co., also a subsidiary of the Associated Gas and Electric Co., of Ithaca, N. Y. Mr. Gibson has been located in Van Wert since 1934.

**L. C. Palmer,** Sandusky, **R. B. Putnam,** Bowling Green, and **W. E. Stith,** Sandusky, were honored last Fall at a banquet given by the employes of the Ohio Fuel Gas Co. for having placed their Fremont, Ohio, district first in a sales contest covering the sale of heating appliances. Each man received $20 in cash and a household gift.

**Morris Campbell,** who has been relief engineer at Clifton, Kan., for the Northern Natural Gas Co. for the past year, has been transferred to the Sioux City, Iowa, plant of the same company, where he will be one of the engineers.

**Walter Harkey,** bookkeeper for the Arkansas-Louisiana Gas Co. at Russellville, Ark., for the past 10 years, has been transferred to a similar position in the company's offices at Monticello, Ark.

**Harry Kull,** of Norborne, Mo., has been transferred to Richmond, Mo., as acting manager there for the Missouri Gas and Electric Service Co., pending the return of **Huston McDonald,** who is temporarily located at Parsons, Kan.

**Champ Rainwater,** manager of the Bristow, Okla., properties of the Oklahoma Utilities Co. for many years, has exchanged places with **George Tasker,** manager of the Drumright, Okla., office.

**G. O. Gage** has become Elk City, Okla., manager for the Central States Power and Light Co., having been transferred from Hobart, Okla. He succeeds **Charles Coblentz,** who was assigned to Holdenville, Okla. **Elmer Simpson** will be the new manager at Hobart.

**H. B. Sneed** has been made manager for the Quanah, Texas, office of the United Gas Corp., having been transferred from Arkansas Pass, Texas.

**Cloyd Harris,** formerly of Memphis, Texas, is now with the United Gas Corp. at Wellington, Texas, succeeding **John Laughlin,** who was transferred by the company to Childress, Texas.

**Albert A. Houck,** president of Albert A. Houck Co., Rochester, N. Y., has been elected to the directorate of the Genessee Valley Gas Co., of New York City.

**John Van Norden,** secretary and manager of sales promotion of the American Meter Co., New York, N. Y., has been appointed assistant treasurer of the Association of Gas Appliance and Equipment Manufacturers. Mr. Van Norden was graduated from the Hotchkiss School and Hamilton College, and studied law for two years at Yale. During the World War he served for 20 months in the U. S. Army.

After leaving college, Mr. Van Norden entered the newspaper and publishing fields, and in 1928 joined the American Meter Co. as advertising manager and assistant secretary.

**Eliza M. Stephenson,** home service director of the Jersey Central Power and Light Co., Asbury Park, N. J., has been appointed chairman of the A. G. A. Home Service Committee for the coming year, succeeding **Gladys B. Price** of the Southern California Gas Co. Mrs. Stephenson is the author of the newspaper features, "Home on the Range" and "Your Home and Mine." She was formerly home service chairman of the New Jersey Gas Association, under whose sponsorship she organized the first statewide home service conference. Before joining the New Jersey company, she taught home economics in Pennsylvania.

**John A. Paterson,** formerly an accountant with the Brooklyn Union Gas Co., Brooklyn, N. Y., has been appointed assistant comptroller. Born and educated in Scotland, Mr. Paterson joined the company in 1930 as a stock record clerk in the accounting department.

**Joseph Burke,** employe of Brooklyn Union Gas Co.'s Flatbush branch, was recently awarded $39.50 for turning in the greatest number of productive sales leads in October. Compensation was awarded also to 180 company employes during October for leads that resulted in appliance sales.

**H. E. Wedge,** who has been manager of the Peoples Natural Gas Co. office at Wayne, Iowa, has been relocated at Spencer, Iowa, from where he will supervise five surrounding towns. Charles Harrison, of Forest City, Iowa, has been placed at Wayne.

**Elmer F. Schmidt,** vice president of the Lone Star Gas Co., Dallas, Texas, last Fall attained the goal of every golfer when he shot a hole-in-one on the 132-yard fourteenth hole at the Dallas Country Club.

## Electra District Leads in Community Co. Sales Drive

THE Electra district of Community Natural Gas Co., Dallas, Texas, headed by H. D. Smith, was leading all districts competing in the contest on sales supremacy of modern gas appliances for the first 10 months of 1939. The contest is sponsored by the Community Natural and Texas Cities Gas Co. and is based on total sales in dollars and cents per meter. It will close Jan. 31, according to C. L. Trevitt, merchandise manager.

In Group 4, Electra district has a volume of $8.84 per meter. Paris district, leader in Group 2 with $8.57 per meter, is second to Electra in the system-wide campaign. In third place and leader of Group 1 is El Paso district, with $8.55, and Vernon district, with $8.26 per meter is in fourth place in the district standing and second in Group 4. Ennis district, with $8.07, leads Group 3 but is in fifth place in the district standing.

Corsicana division, L. M. Scholl, superintendent, is leading in the division competition, with $5.81 per meter, followed in the order named by Denison division, J. Y. Wheeler, superintendent, $5.80 per meter, one cent behind Corsicana; Waco division, A. P. Rowland, superintendent, $5.31, and Abilene division, M. L. Bird, superintendent, $5.05.

■ ■

## EMCO Sponsors Employes' Course in Gas Engineering

A course of instruction in the fundamental sciences necessary to the natural gas industry has been inaugurated by the Pittsburgh Equitable Meter Co., Pittsburgh, Pa., for their employes. The course is under the supervision of the Extension Division, Pennsylvania State College.

At present, 60 men have enrolled and are meeting once each week. Covering a two-year period, instruction will consist of a review of arithmetic, algebra, chemistry and physics during the first year, while in the second year the course will be devoted to the problems connected with the production, transmission, regulation, measurement and utilization of natural gas.

Instructors will be recruited from the engineering department of the Pittsburgh Equitable Meter Co. under the direction of Chief Engineer A. D. MacLean.

■ ■

## Appliance Society Awards Winners of Display Contest

The Gas Appliance Society of California has made awards to the winners in its window display and ad writers contest held in conjunction with the annual Fall gas range campaign. First prizes were given to the following:

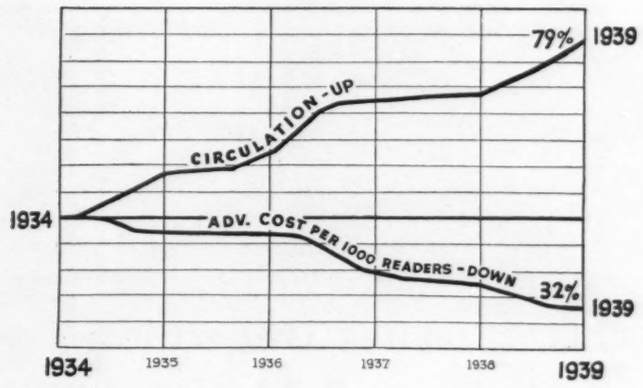
*Window Display Contest*—(District No. 1) P. M. Spencer, San Francisco; (district No. 2) Louis Hordi, Sacramento; (district No. 3) Jack Remmer, Merced.

*Ad Writers Contest*—(District No. 1) Mildred Peery, Oakland; (district No. 2) Cedric S. Porter, Sacramento; (district No. 3) Ralph Jewell, Vallejo.

■ ■

## Lower Rates for Ohio Town ..

The village council of Port Clinton, Ohio, has approved a new gas franchise for the Ohio Fuel Gas Co. which is expected to effect an average saving in gas costs to the consumers of $2.16 per year. The new franchise will become operative Jan. 12, and is for a five year period.


**CIRCULATION UP 79%**
**ADVERTISING COST PER READER DOWN 32%**

1. Circulation has increased 79% in the past 5 years.
2. Advertising costs per 1,000 readers have decreased 32% in the past 5 years.
3. GAS has more individual subscribers than any other Gas Industry publication.
4. 84% of its advertisers have used GAS consistently for more than one year. Proof that they find GAS a profitable medium.

THE TOTAL CIRCULATION DISTRIBUTION OF GAS AVERAGES 5,256 COPIES PER ISSUE — A.B.C. 6-30-39

ABC GAS ABP

*The* **NATIONAL** *Gas Magazine*

810 S. SPRING ST. . . . . LOS ANGELES
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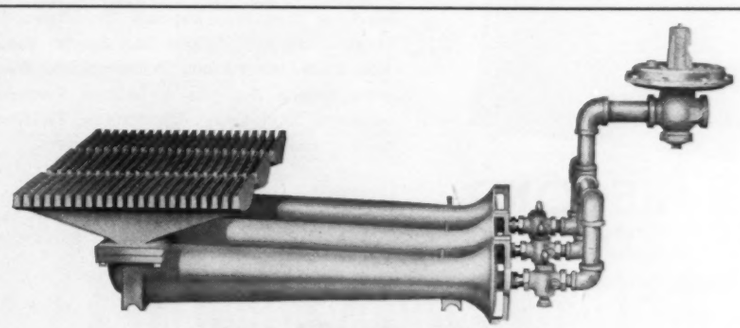
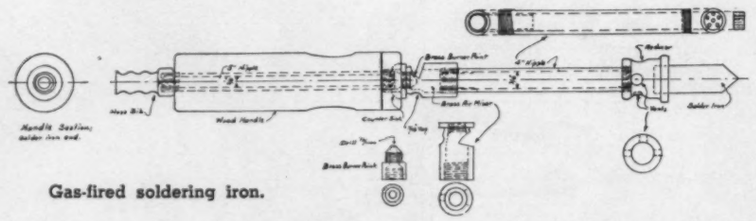


**INDUSTRIAL GAS BURNERS**
*Primarily designed for high pressure vertical type boilers, viz., press machine, vulcanizing, dairy boilers, etc.*
**P. M. LATTNER MFG. CO.** **Cedar Rapids, Iowa**



Gas-fired soldering iron.

# P.C.G.A. Issues Utilization Data Bulletin on Soldering Irons

GAS Utilization Data Bulletin No. 55 issued in July by the Pacific Coast Gas Association deals with an atmospheric soldering iron and was prepared by Ray Trowbridge of the Seattle Gas Co., Seattle, Wash.

According to Mr. Trowbridge, the gas-heated soldering iron illustrated above has proved to be a practical and economic device. It heats quickly, and is more durable than the electric iron because it has no elements to burn out or wires to break because of constant bending.

The iron can be made up in several sizes. The iron illustrated is 13.5 in. over-all and has been in use for several years in the manufacture of flour-sifters. In this use it replaced electric irons and in the judgment of the manufacturer, has proved its superiority over the electric appliances. The manufacturer has 10 or 12 gas irons of varying sizes in use.

The small iron uses approximately 1.5 cu. ft. of 500 B.t.u. gas per hour. The wooden handle is made of soft wood, pine or cedar, and the fittings are standard pipe fittings. The soldering tip is of course copper. The burner tip has a number of small drilled holes in the smaller models. In the larger models a nickel screen has given excellent results.


HANDBOOK
BUTANE-PROPANE
GASES

*415 Pages*

**CONTENTS: Semi-Bulk Distribution: Use of Butane in Buses: Combination Propane Operated Utility Plant: Use in Internal Combustion Engines: Design & Installation of Storage: Supply from Petroleum Refineries: Engineering Data on the Lower Olefins: Domestic Appliance Testing and Utilization: Economical Comparisons with Coal, Oil, Electricity, Producer Gas, Manufactured Gas: Town Plants: Manufacture from Natural Gas: Special Uses: Volume Correction Factors: Transportation: Use with other Gases: Analysis & Testing: Properties of Mixtures: Bottled Gas Distribution: Bibliography: Central Plant Directory: Catalog Section.**

**SECOND EDITION** (Revised November, 1938) **$5.00** *Plus Postage*

*We pay the postage on orders accompanied by remittance*

Published by Western Business Papers, Inc., publishers of

GAS

*The NATIONAL Gas Magazine*

OIL & GAS Equipment Review, 810 S. SPRING ST. Los Angeles, Calif.


## Worthington Offers New Line Of Turbine Well Pumps

A NEW line of turbine well pumps is announced by the Worthington Pump and Machinery Corp. of Harrison, N. J. For use in bored wells, these new units feature vacuum molded impellers, the first time this construction has been used in this type of pumping equipment.

Vacuum molded impellers are said to be in perfect balance, while the smoothness of the blade surfaces and uniformity of the castings result in high efficiency and greater certainty of performance. Wear or abrasion in the impellers is reduced to a very negligible minimum by the use of hard, high-tensile bronze. Available with either enclosed oil-lubricated or open water-lubricated shaft bearings, these new turbine well pumps are readily adaptable to individual local conditions.

Important details of construction are illustrated in Worthington bulletin H-450-B29. A companion bulletin, H-450-B30, deals particularly with the vacuum molded impellers used in these pumps.

■ ■

## Sioux Falls, S. D., Given Gas Rate Reduction

Twelve hundred house heating customers of Sioux Falls, S. D. will benefit from reductions in gas rates that became effective in December, according to S. D. Whiteman, vice president and general manager of the Sioux Falls Gas Co. Under the new schedule, fixed charges for house heating have been eliminated and a graduated charge substituted for the first nine therms.

An additional 6900 domestic users will receive the benefit of a reduced penalty rate from 10 per cent to 7 per cent on bills not paid within the discount period.

The 325 commercial users of gas in Sioux Falls will also benefit from the rate and penalty reductions.

■ ■

## Chickasha Zone Enlarged

A third gas producing zone was opened in the Chickasha, Okla., gas field, early in November, when the Sinclair-Prairie brought in a well which produced 72,000,000 cu. ft. of dry gas per day. The well is No. 4 Charlson in NE NE SE of 22-5n8w. The gas blew out while the drilling crew was pulling pipe after drilling to 3941-69 ft.

The second deep zone in the field was discovered early this year by Carter Oil Co., at 5100 to 5200 ft.

■ ■

## Rate Reduction Denied

The Oklahoma Corporation Commission, in a journal entry, November 24, denied the application of a group of Oklahoma City consumers for a decrease in domestic gas rates charged by the Oklahoma Natural Gas Co., at Oklahoma City, Okla.

■ ■

## Wisconsin Utility Man Dies

Charles A. Mikulesky, general sales manager of Wisconsin Gas and Electric Co., Racine, Wis., died recently of a heart attack at his home. He had served as general sales manager of that utility since 1926.

■ ■

## Dowagiac to Have New Plant

The American Natural Gas Co., Pittsburgh, Pa., has recently announced its plans to construct a gas production plant and distribution system in Dowagiac, Mich.

S. B. Severson, vice president and general manager, and J. F. Sweeney, division superintendent of Republic Light, Heat & Power Co., present the $50 prize to Marden E. Cobb.

## Prize Students in Industry Home Study Courses Receive Awards

TWO students of home study courses on the gas industry, Chester R. Mathes, The Brooklyn Union Gas Co., Brooklyn, N. Y., and Marden E. Cobb, Republic Light Heat and Power Co., Inc., Buffalo, N. Y., were honored recently with $50 prizes for having attained the most comprehensive knowledge of the subject matter in their respective courses. Mr. Mathes won his award for his work on the course on American Gas Practice conducted by Columbia University, while Mr. Cobb was recognized for his efforts in connection with the course on natural gas offered by the University of Kansas.

Both courses are sponsored by the American Gas Association and are supervised by advisory committees made up of eminent gas engineers appointed by the Association. The $50.00 prizes were offered by the Committee on Personnel Practices of the A.G.A. to students completing the home study courses during the year from September 1, 1938 to September 1, 1939.

Clifford E. Paige, president of The Brooklyn Union Gas Co., presented the $50 check to Mr. Mathes at a special ceremony during the company's annual Service Emblem Dinner. Presentation of Mr. Cobb's award was made by S. B. Severson, vice-president of the Republic Light Heat and Power Co., Inc., at a testimonial dinner in Dunkirk, New York on November 16.

Announcement of the prize offers stimulated great interest among students of both courses.

■ ■

## Southern California Gas Co. Plans Expansion in Riverside

Increased demands for the company's service and products has compelled the Southern California Gas Co. to prepare plans for the enlargement of its Riverside, Calif., office and distribution plant. Estimates of cost for a new concrete building are placed at $8000 and alterations to the existing building at $2000.

During the past year, operations of the company have been featured in Riverside by a reduction in rates and by the securing of a new franchise under which a percentage on gross annual proceeds will be paid to the city, a provision not contained in the old franchise.

■ ■

## Utility Publication Carries Employe Intelligence Test

An intelligence test covering public utility organization and operations was featured in the December issue of *The Gas Flame*, house organ for the Citizens Gas and Coke Utility, Indianapolis, Ind. Based on a test appearing in *Time* magazine, this examination consisted of 20 questions on utility affairs, each followed by five answers, one of which was correct. Answers to the questions were given on another page.

■ ■

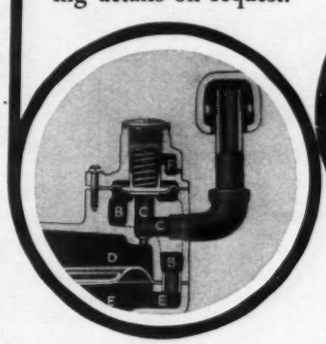
## Kansas City Gas Co. Remodels

The sales floor and basement of the Plaza office of the Kansas City Gas Co. have been completely remodeled and redecorated and a new indirect lighting system installed.

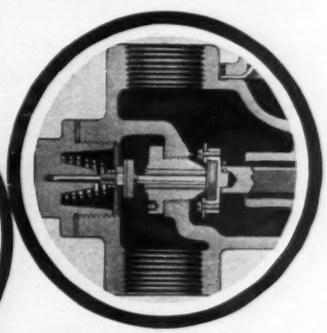
One of the particular objectives of the remodeling operations was to gain ground floor space for the display of gas appliances.


REYNOLDS NEW HOUSE SERVICE Regulator
WITH AUTOMATIC GAS CUT-OFF and DIAPHRAGM OPERATED RELIEF VALVE!

☆ This No. 1 New Model 30 Regulator combines the tried and proven safety features of the original Little Giant and the newer Model 30, Little Giant, with an improved design which greatly increases its sensitivity. This Regulator has the automatic valve on the inlet side to shut off the gas in case of failure on the inlet line. It has a removable spring which permits the spring to be changed without taking off the top or disturbing the installation. Operation of the New Built-In Diaphragm operated Spring Adjusted Safety Valve is explained below. Complete operating details on request.




Normal breathing of Regulator is from Chamber "D" through port to "C". Operating pressure is in chambers "E" and "B". An increase in pressure above spring setting in diaphragm safety valve "F" raises diaphragm above chamber "B" releasing pressure through opening "C".



AUTOMATIC CUT-OFF WITH NEW SOFT SEAT

The pin extending through the center of the pressure spring permits easy resetting. With the new Soft Seat, it is easy to remove without taking the Regulator out of the line, which is impossible in the original Little Giant or the newer Model 30 Little Giant house Regulator.

BRANCH OFFICES:
422 Dwight Building, Kansas City, Missouri.
2nd Unit, Santa Fe Building, Dallas, Texas.

REPRESENTATIVES:
Eastern Appliance Company, Boston, Massachusetts.
Wm. A. Ehlers, No. 268 Park Street, Upper Montclair, N. J.

REYNOLDS Gas REGULATOR CO ANDERSON INDIANA U·S·A

GAS CONTROL SINCE 1892

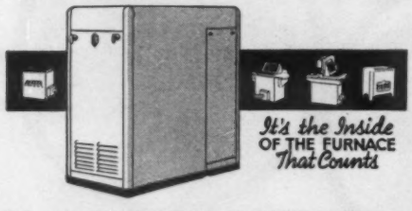
Its resistance to corrosion saves you money

Also economically ideal for Butane-Propane installations, hot water distribution lines and hot water heating lines. 3922

ANACONDA

THE AMERICAN BRASS COMPANY
WATERBURY • CONNECTICUT
Subsidiary of Anaconda Copper Mining Company

SETS THE PACE FOR CAREFREE HEATING




New P.A.C. by FRASER

A striking new model of the Fraser Forced Air Family, Package Air Conditioning, meets an ever-increasing demand for a compact, totally enclosed unit embracing all of the important features of WINTER AIR CONDITIONING.

Ease of connecting cold air returns, complete assembly and wiring of all controls and motor together with many other time-saving features, render this model a favorite among dealers and installation men.

Fraser design and quality are your best assurance of customer satisfaction — and profit making sales.

Write for illustrated folder with complete specifications.

H. R. BASFORD CO. *Distributors* San Francisco-Los Angeles

FRASER FURNACE CO. *Manufacturers* Stockton, California

FRASER
GAS HEATING EQUIPMENT

# MODERN *Products*

## Control

*Milwaukee Gas Specialty Co., Milwaukee, Wis.*

*Model: Basoid.*

*Description:* The Basoid is a compact, sturdy, control, combining in one unit the Baso valve and the MGSCo. solenoid valve. The unit automatically controls gas flow to the appliance and provides complete shut-off in the event of pilot flame failure, utilizing a single valve model for all fuel gases. Solenoid valve special design feature provides continuous quiet operation. The Basoid is adaptable for use in controlling gas to circulating heaters, gas fired steam radiators, boilers, floor furnaces, and central heating furnaces. Models are available in ¾ in. and 1 in. valve sizes for any of the usual frequencies and voltages.

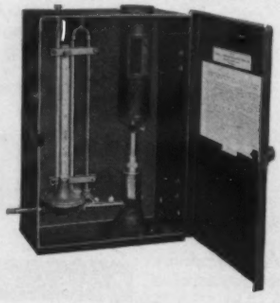
■ ■

## B.t.u. Indicator

*Connelly Iron Sponge and Governor Co., 3154 S. California Ave., Chciago, Ill.*

*Description:* A calorimeter, known as the Caloroptic is an automatic watchman that keeps the product of gas plants up to the required heat value standard and which hollers for help if anything goes wrong. The instrument can be installed in permanent position and is valuable in mixed gas plants or propane-butane-air gas systems, as well as in regular manufactured-gas plants. When setting the Caloroptic to provide a constant indication of the increase or decrease in B.t.u. content of the gas, the air port is adjusted so as to provide some yellow in the flame to actuate the cell, which in turn is connected to and operates an extremely sensitive electric relay, which operates red and white lights to indicate at a distance the condition of the gas. The relays can also be connected to a horn or a bell to call the operator's attention to B.t.u. changes. The Caloroptic can also be carried about handily to take spot readings. The principle of operation is based on regulating the volume of primary air to give perfect combustion in the burner flame.

*Catalog:* A new illustrated bulletin describing the Caloroptic has been released. Free copies may be obtained by writing this publication, or the manufacturer direct.



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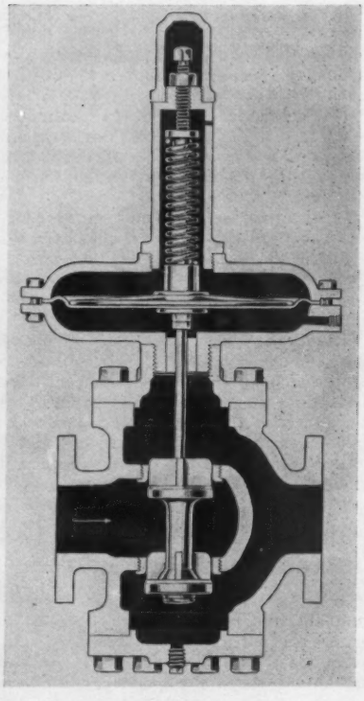

## Reducing Valves

*Fisher Governor Co., Marshalltown, Iowa.*

*Model:* 217AS and 217AL.

*Description:* These reducing valves are designed for receiving a varying or high pressure at the inlet side and automatically delivering a constant reduced pressure to the outlet system. They are suitable for installation on steam, air or gas lines.

Type 217AS is spring actuated, while Type 217AL is designed for lever and weight operation. Both valves have full capacity bodies fitted with double discs, ground bevel seats, and balanced inner valves which are not affected by fluctuating pressures. Valve bodies can be easily inverted in order to convert the reducing valves into relief valves.

Eleven different sizes of sensitive multiple corded diaphragms are available to meet specific pressure requirements for air, steam, gas and other fluids.

# Build *PERMANENT GAS LOADS*

with

## HUMPHREY GAS UNIT HEATERS

Retail stores of all kinds, garages, service stations, factories, shops, warehouses, churches, public auditoriums, theatres, lodges . . . the opportunities are almost unlimited to put hundreds of permanent gas buying customers on your lines with Humphrey Gas Unit Heaters. Make a note now to plan a space heating survey of your territory early in 1940.

Easiest to sell and easiest to service are Humphrey Gas Unit Heaters. Their exclusive design Forced Air Combustion, exclusive Thermolectric Pilot Control, and exclusive Humphrey-Baso Combination Gas Valve result in heaters that are 30% more compact and virtually trouble-proof. Modern design and modern finishes appeal to today's beauty-minded executives.

Wherever your operations are concentrated — whether you sell manufactured or natural gas or both — there is a challenging opportunity to expand your permanent gas loads with Humphrey Gas Unit Heaters. Send today for complete information and proven merchandising methods.

**GENERAL GAS LIGHT COMPANY**

KALAMAZOO, MICHIGAN

23 Warren St., NEW YORK CITY 2nd Unit Santa Fe Bldg., DALLAS 475 Eleventh St., SAN FRANCISCO

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*Don't Dig Up Lawns or Pavements!*

INSTALL PIPE WITH A

GREENLEE *Hydraulic* PIPE PUSHER

The Greenlee Pusher will take pipe up to 4-inch and has 6 operating speeds. Pumping the handles sets up pressure within the cylinders, causing the unit to move forward on the steel base. These bases are made in lengths for pushing from 4 to 7 feet with but one setting of the pipe clamp.

### *It's Faster—Easier—Cheaper*

Efficiency in the installation of pipe under lawns, streets, railroads, etc., comes from quickly pushing the pipe in place with the least possible trenching. Not only does it prevent damage, but it avoids interference with traffic and saves considerable time and money on the job.

The Greenlee Hydraulic Pusher requires a trench just long enough for the pushing operation; and one man, standing in a comfortable position can send the pipe where wanted, simply by pumping the handles. It is readily portable, easy to set up and simple to operate.

This tool is saving money for a list of users that grows larger each week. It can do that for you, too. Let us tell you about it.

Below: Set up for pushing under a paved street on a National Highway.

GREENLEE TOOL CO., 1700 Columbia Ave., ROCKFORD, ILLINOIS

## Gas Consumers Cooperative Will Serve Chelsea, Okla.

The problem of serving Chelsea, Okla., residents with natural gas apparently has been permanently settled by the Corporation Commissioner's approval of the application of the Gas Service Co., Kansas City, to withdraw, and the order that their distribution system be turned over to the Consumers Cooperative Gas Co.

The new concern is owned and operated by Chelsea gas consumers.

**More than 100 members of the Detroit-Michigan Stove Co., including district representatives gathered in Detroit last month for the company's annual sales convention to hear Director of Sales John C. Pankow present merchandising plans for 1940. The company plans a year-long advertising campaign in "McCall's," "Saturday Evening Post," "Woman's Home Companion," and "Good Housekeeping."**

GEORGE A. BURRELL
*Petroleum and Gas Engineer*
Design—Construction—Reports
Suite 1909
20 Pine Street, New York City
1936-42 5th Avenue, Pittsburgh, Pa.

ROBERT J. KUHN
*Consulting Engineer*
CATHODIC PROTECTION
Transmission Lines — City Networks
Electrolysis — Corrosion Surveys
Nationwide Service
1644 Canal Bank Bldg. New Orleans, La.

Those who make an art of living depend on this world famed hotel as the very embodiment of gracious service, true refinement and dignified hospitality.

Under the Same Management as
The Gotham, New York City
The Drake, Chicago
The Evanshire, Evanston, Ill.
The Town House, Los Angeles
A. S. Kirkeby, Managing Director

The Blackstone
MICHIGAN AVENUE · CHICAGO

## Over 500 Plants Inspected By Laboratories in 1939

Over 500 gas appliance factories, assembly plants, dealers' and jobbers' warehouses were inspected by the A.G.A. Testing Laboratories' inspectors in completing the 1939 annual inspection program of the American Gas Association. In view of the record number of appliances tested at the Laboratories during the past fiscal year, and particularly the number of new manufacturers who have submitted their equipment for the first time, the number of inspection visits to be made exceeds that for any previous year.

Radiating from Cleveland and Pacific Coast branch laboratories, manufacturers from Boston to San Francisco and Montreal to Houston were visited. Representatives from Cleveland made about three-quarters of the total calls; the remainder were covered from Los Angeles. At present, 16 engineers are engaged in inspection activities at both laboratories.

## Zenith Gas System of Alva, Okla., Reduces Rates

Following conferences between E. M. Myers, gas and electric engineer, and Paul Reed, head of the bureau of accounting, Oklahoma Corporation Commission, with officials of the Zenith Gas System, Inc., Alva, Okla., the company agreed to a 10% cut in its domestic gas rate on the first step. This rate, covering the first 20,000 cu. ft. used per month, is reduced from 55c per M c.f. to 50c.

The reduction applies to the following cities and towns served by the company: Alva, Woodward, Cherokee, Waynoka, Quinlan, Avard, and Mooreland. It becomes effective with bills payable January 1, 1940.

## Cooking, Heating Leaders Hold Cincinnati Meeting

Appliance manufacturers prominent in the gas industry were featured on the program of the seventh annual convention of the Institute of Cooking and Heating Appliance Manufacturers held at the Netherland Plaza Hotel, Cincinnati, Ohio, December 13 to 15. The second afternoon session was presided over by A. H. Rose, The Moore Corp., Joilet, Ill. Ray Sterbenz, Florence Stove Co., Kankakee, Ill., discussed production control and Lucian Kahn, treasurer, The Estate Stove Co., of Hamilton, Ohio, served as toastmaster at the annual banquet. Forty exhibits of modern materials, accessories, and equipment used in the manufacture of cooking and heating appliances were on display during the convention.

R. T. Frazier, vice president, Cavalier Corp., Chattanooga, Tenn., was chairman of the convention.

## Washington Stores Sponsor Home Service Activities

The Washington Gas and Electric Co., Tacoma, has started a series of home service demonstrations in cooperation with a chain of grocery stores and two department stores. Every Saturday all-day demonstrations are given in the grocery stores with a gas range installed on the sales floor and the home service girls showing customers how to prepare the foods being advertised by the store.

In the department stores the demonstrations are presented before clubs who have been invited by the store to attend.

## Charles O'Neill, Long With The Gas Service Co., Dies

Charles O'Neill, manager of the Webb City office of the Gas Service Co. of Kansas City, since it was opened in 1906, passed away on Nov. 1 in Webb City, Mo.

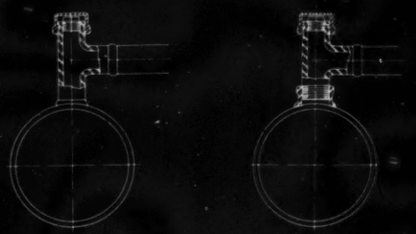
Mr. O'Neill was born in 1863 at Liverpool, N. Y., and engaged in business for himself in Ohio, Washington and Kansas before assuming the management of the Webb City office at the time the gas system was installed there.

## McAllen, Texas, Gas System

Commissioners of McAllen, Texas, published requests for bids in November for construction of a municipally owned natural gas distribution system. The proposal includes a 6-in. gas line leading from the R. E. Harding No. 1 Card, gas and distillate producer in the McAllen field some 500 ft. beyond the city limits to the West McAllen industrial district about a mile and a half distant. The estimated cost is $1600.

## Ed Williams Passes Away

Ed Williams, 67, oldest employe in point of service with the Oklahoma Natural Gas Co. in Oklahoma City, passed away in November. He was born in Louisville, Ky., and was employed by the company in 1906.

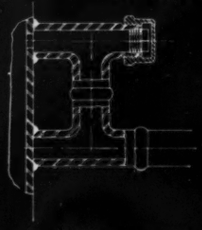


Solid Welded



With Welded Collar

Swing Joint Outlet



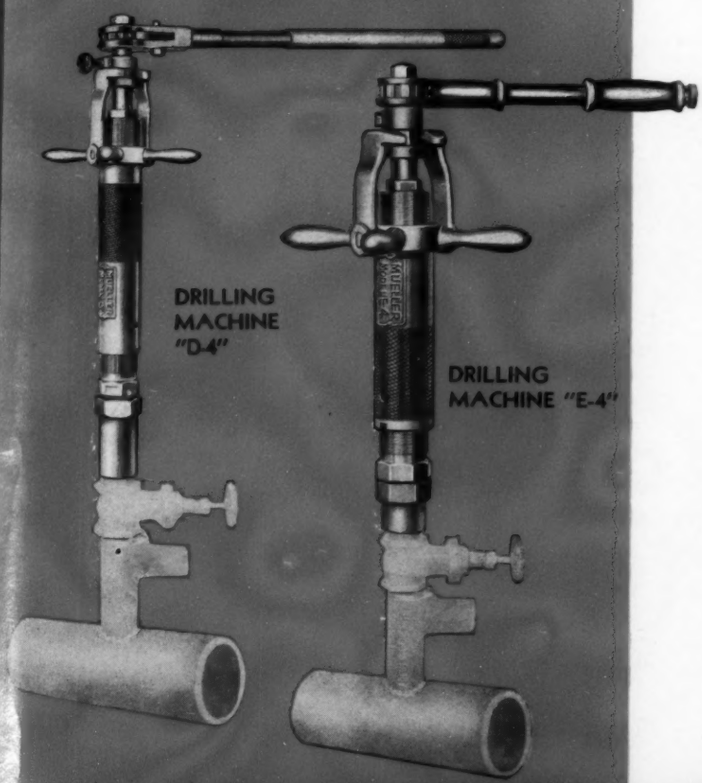
Branch Main Extensions

# SOLID WELDED INSTALLATIONS

## INSTALL OR SHUT OFF SERVICES WITHOUT GAS BLOW

H-10415 Brass Inserting Plug

H-10410 Steel Welding Tee For Solid Welded Installation



DRILLING MACHINE "D-4"

DRILLING MACHINE "E-4"

**Mueller Steel Welding Tees are made from low carbon steel of the same analysis as steel pipe and are designed and tested for use on working gas pressures up to 500 lbs. per sq. in. They are easily welded to any main or service pipe and permit the installation of a service without letting the gas blow.**

**The popular Mueller E-4 or D-4 Drilling Machines are generally used in connection with the Steel Welding Tees. The double thread on the top of the tee allows a valve to be used between the tee and the drilling machine thus permitting the valve to be closed after the drilling, and an inserting tool and plug used to replace the drill in the machine, after which the plug may be inserted in the inside tapping under pressure. Service may be shut off by merely reversing the process and using a tapered steel shut-off tool while repairs to the service line are being made.**

**Tees are regularly furnished for solid welded installation or may be secured with threaded bottom or side connections on special order. Sizes from ¾" to 2" inclusive.**

**Write Us For Full Information**

Since 1857

# MUELLER CO. DECATUR ILL.

Since 1857

**S** implicity of construction.

**P** arts interchangeable.

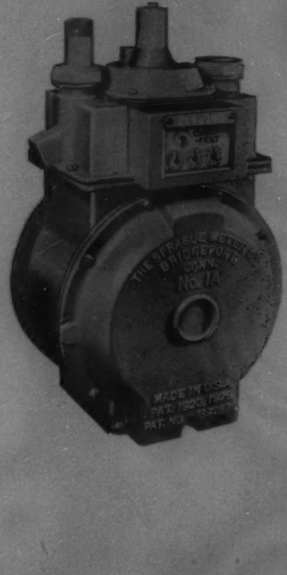
**R** educed operating costs.

**A** ccuracy in registration.

**G** ives satisfactory service.

**U** niform performance.

**E** fficient and dependable in manufactured, natural and Butane Gases.



# THE SPRAGUE METER CO. BRIDGEPORT, CONN.